1
BASIC CONCEPTS & PRODUCT COST SHEET

Question 1

SV Ltd. Is a manufacturing company which has a sound system of financial accounting. The management of the company therefore feels that there is no need for the installation of a cost accounting system. Prepare a report to the management bringing out the distinction between cost and financial accounting system and the need for the introduction of a sound cost accounting system.

Answer

The Managing Director,
S.V. Ltd.
New Delhi

Subject : Establishment of a Cost Accounting System

Sir,

During the course of our discussion with you last month, you mentioned that your company did not require a cost accounting system as it had a sound financial accounting system. After our discussion with you, we had an opportunity to study the products, processes of manufacture, organisation and selling and distribution methods of your company-which is a manufacturing company. We have come to the conclusion that your company certainly requires a cost accounting system. To strengthen further our view-point, we give our report by bringing the distinctions between the two systems as below:

The financial accounting system of a company mainly serves as a useful source of information to owner/shareholders/creditors and for tax purposes. It does not provide adequate help to the executives working in the organisation. The information provided by the financial accounting system serves no useful purpose from the view-point of planning, control and decision making. The absence of required information renders planning, control and decision making extremely difficult. On the other hand, cost accounting system was evolved as a supplementary accounting method mainly to serve the needs of management. Cost accounting system can provide at a regular interval, the needed information to the concerned executives to perform the functions of planning, control and decision making.

The financial accounting system shows the trading results of the company as a whole; it does not answer the question why there is an increase or a decrease in profit or loss. The principle of matching costs with revenues under a costing system not only indicates the profit or loss of each product, but would also show the correct value of closing inventory. Thus costing system helps financial accounting system too. Under financial accounting system the

financial statements are prepared only at the close of the accounting period. Such statements do not provide day-to-day cost information for evaluating the efficiency of the concern. But cost accounting system can supply every possible cost information to management for managerial control. Under cost accounting system by using standard costing the variances between predetermined and actual costs can be determined. These variations and their causes speaks about the concern's operating efficiency and inefficiency.

In financial accounting system no attempt is generally made to record data by jobs, processes, products, departments etc. It only provides information in terms of income, expenses, assets and liabilities for the company as a whole. Thus the available information is not very useful for the ascertainment of price, control of costs, ascertainment of product profitability etc. Cost accounting system records data in the manner that helps the ascertainment of price and profitability and also the control of costs by using variances.

Government in its efforts to protect consumers, often resorts to statutory price control. Cost accounting system can help by providing enough cost information which could be utilised to press upon the government to convince for price and to arrive at a suitable price before their arbitrary fixation of it.

It is apparent from the above discussion that detailed and analytical information cannot be had from existing financial accounting system. We therefore strongly recommend the need for the introduction of a sound cost accounting system in your concern.

Yours faithfully,

X . Y.& Co.

Chartered Accountants.

Question 2

(a) Define the terms 'cost centre' and 'cost unit'.

(b) Given below is a list of ten industries. Give the method of costing and the unit of cost against each industry.

- *(i) Nursing Home*
- *(ii) Road Transport*
- *(iii) Steel*
- *(iv) Coal*
- *(v) Bicycles*
- *(vi) Bridge Construction*
- *(vii) Interior Decoration*
- *(viii) Advertising*
- *(ix) Furniture*
- *(x) Sugar company having its own sugarcane fields.*

Answer

(a) Cost Centre

The term cost centre is defined as a location, person or an item of equipment or a group of these for which costs may be ascertained and used for the purposes of cost control. Cost centres can be personal cost centres, impersonal cost centres, operation cost centres and process cost centres.

Cost Unit

The term cost unit is defined as a unit of quantity of product, service or time (or a combination of these) in relation to which costs may be ascertained or expressed. It can be for a job, batch, or product group.

(b)

Industry	*Method of costing*	*Unit of cost*
(i) Nursing Home	Operating	Per Bed per week or per day
(ii) Road transport	Operating	Per Tonne Kilometer or per mile
(iii) Steel	Process	Per Tonne
(iv) Coal	Single	Per unit
(v) Bicycles	Multiple	Each unit
(vi) Bridge construction	Contract	Each contract
(vii) Interior Decoration	Job	Each Job
(viii) Advertising	Job	Each Job
(ix) Furniture	Multiple	Each unit
(x) Sugar company having its own sugar-cane fields	Process	Per Quintal/Tonne

Question 3

Distinguish between

(i) Cost Unit and Cost Centre

(ii) Cost Centre and Profit Centre

(iii) Bill of material from a material requisition note.

Answer

(i) Distinction between Cost Unit and Cost Centre

The term Cost Unit is defined as a unit of quantity of product, service or time (or a combination of these) in relation to which costs may be ascertained or expressed. It can be for a job, batch, or product group.

The term Cost Centre is defined as a location, person or an item of equipment or a group of these for which costs may be ascertained and used for the purposes of Cost Control. Cost Centres can be personal Cost Centres, impersonal Cost Centres, operation cost and process Cost Centres.

Thus each sub-unit of an organisation is known as a Cost Centre, if cost can be ascertained for it. In order to recover the cost incurred by a Cost Centre, it is necessary to express it as the cost of output. The unit of output in relation to which cost incurred by a Cost Centre is expressed is called a Cost Unit.

(ii) Cost Centre and Profit Centre

A Cost Centre is the smallest segment of activity or the area of responsibility for which costs are accumulated. A Profit Centre is that segment of activity of a business which is responsible for both revenue and expenses and discloses the profit of a particular segment of activity.

Important points of distinction between Cost Centre and Profit Centre are as below:

(a) Cost Centres are created for accounting convenience of costs and their control. Whereas a profit centre is created because of decentralisation of operations.

(b) A Cost Centre does not have target costs but efforts are made to minimise costs, but each profit centre has a profit target and enjoys authority to adopt such policies as are necessary to achieve its targets.

(iii) Bill of Material and Material Requisition Note

Bill of Material: It is a comprehensive list of materials with exact description and specifications, required for a job or other production units. This also provides information about required quantities so that if there is any deviation from the standards, it can easily be detected. It is prepared by the Engineering or Planning Department in a standard form.

Material requisition Note: It is a formal written demand or request, usually from the production department to store for the supply of specified materials, stores etc. It authorises the storekeeper to issue the requisitioned materials and record the same on bin card.

The purpose of bill of material is to act as a single authorisation for the issue of all materials and stores items mentioned in it. It provides an advance intimation to store department about the requirements of materials. It reduces paper work. It serves as a work order to the production department and a document for computing the cost of material for a particular job or work order to the cost department.

The purpose of material requisition note is to draw material from the store by concerned departments.

Question 4

(a) Match the following

(i) Total fixed cost	*1. What cost should be?*
(ii) Total variable cost	*2. Incurred cost*
(iii) Unit variable cost	*3. Increase in proportion to output*
(iv) Unit fixed cost	*4. Cost of conversion*
(v) Standard cost	*5. What costs are expected to be*
(vi) Period cost	*6. Decreases with rise in output*
(vii) Actual cost	*7. Remains constant in total*
(viii) Labour and overhead	*8. Remains constant per unit*
(ix) Incremental cost	*9. Cost not assigned to products*
(x) Budgeted cost	*10. Added value of a new product.*

(b) Indicate whether the following statements are True or False:

(i) All costs are controllable.

(ii) Conversion cost is equal to direct wages plus factory overhead.

(iii) Variable cost per unit varies with the increase or decrease in the volume of output.

(iv) Depreciation is an out of pocket cost.

(v) An item of cost that is direct for one business may be indirect for another

(vi) Fixed cost per unit remains fixed.

Answer

(a) Correct matchings are indicated as below:

(i) ---------- (7)

Total fixed cost, remains constant in total.

(ii) ----------(3)

Total variable cost, increases in proportion to output.

(iii) ----------(8)

Unit variable cost, remains constant per unit.

(iv) ----------(6)

Unit fixed cost, decreases with rise in output.

(v) ----------(1)

Standard cost, what cost should be.

(vi) ----------(9)

Period cost, cost not assigned to products.

(vii) ----------(2)

Actual cost, incurred cost.

(viii) ----------(4)

Labour and overhead, cost of conversion.

(ix) ----------(10)

Incremental cost, added value of a new product.

(x) ----------(5)

Budgeted cost, what costs are expected to be.

(b) (i) False

(ii) True

(iii) False

(iv) False

(v) True

(vi) False

Question 5

List down any eight factors that you will consider before installing a costing system.

Answer

The eight factors which must be considered before installing a Costing System are listed below:

(i) *Nature of business:* The system of costing to be introduced should suit the general nature of business.

(ii) *Layout aspects:* The size and layout of the organisation should be studied by the system designers.

(iii) *Methods and procedures in vogue:* The system designers should also study various methods and procedures for the purchase, receipts, storage and issue of material. They should also study the methods of wage payment.

(iv) *Management's expectations and policies:* The system of costing should be designed after a careful analysis of the organisational operations, management's expectation and the policies of the concern.

(v) *Technical aspects:* The technical aspects of the business should be studied thoroughly by the designers. They should also make an attempt to seek the assistance and support of the supervisory staff and workers of the concern for the system.

(vi) *Simplicity of the system:* The system of costing to be installed should be easy to understand and simple to operate. The procedures laid down for operating the system should be easily understood by operating system.

(vii) *Forms standardisation:* Various forms to be used by the costing system for various data/information collection and dissemination should be standardised as far as possible.

(viii) *Accuracy of data:* The degree of accuracy of data to be supplied by the system should be determined.

Question 6

Outline the steps involved in installing a costing system in a manufacturing unit. What are the essentials of an effective costing system?

Answer

The main steps involved in installing a costing system in a manufacturing unit may be outlined as below:

(i) The objectives of installing a costing system in a manufacturing concern and the expectations of the management from such a system should be identified first. The system will be a simple one in the case of a single objective but will be an elaborate one in the case of multiple objectives.

(ii) It is important to ascertain the significant variables of the manufacturing unit which are amenable to control and affect the concern. For example, quite often the production costs control may be more important than control of its marketing cost. Under such a situation, the costing system should devote greater attention to control production costs.

(iii) A thorough study to know about the nature of business, its technical aspects; products, methods and stages of production should also be made. Such a study will facilitate in selecting a proper method of costing for manufacturing unit.

(iv) A study of the organisation structure, its size and layout etc., is also necessary. This is useful to management to determine the scope of responsibilities of various managers.

(v) The costing system should be evolved in consultation with the staff and should be introduced only after meeting their objections and doubts, if any. The co-operation of staff is essential for the successful operation of the system.

(vi) Details of records to be maintained by the costing system should be carefully worked out. The degree of accuracy of the data to be supplied by the system should be determined.

(vii) The forms to be used by foreman, workers, etc., should be standardised. These forms be suitably designed and must ensure minimum clerical work at all stages.

(viii) Necessary arrangements should be made for the flow of information/data to all concerned managers, at different levels, regularly and promptly.

(ix) Reconciliation of costs and financial accounts be carried out regularly, if they are maintained separately.

(x) The costing system to be installed should be easy to understand and simple to operate.

Essential of an effective costing system: The essential features that an effective costing system should possess are as follows:

(a) Costing system should be tailor made, practical, simple and capable of meeting the requirements of a business concern.

(b) The method of costing should be suitable to the industry.

(c) Necessary co-operation and participation of executives from various departments of the concern is essential for developing good cost accounting system.

(d) The cost of installing and operating the system should justify the results.

(e) The system of costing should not sacrifice the utility by introducing meticulous and unnecessary details.

Question 7

Distinguish between the following?

Controllable costs and uncontrollable costs. *(May, 1997, 4 marks)*

Answer

Controllable costs and uncontrollable costs:

Costs which can be influenced by the action of a specified person in an organisation are known as controllable costs. Costs which remains unaffected by the action of such person are termed as uncontrollable. In a business organisation heads of each responsibility centre are responsible to control costs. Costs which they are able to control are known as controllable and includes material, labour and direct expenses. Costs which they fail to control includes fixed costs and all allocated costs.

It may be noted that controllable and uncontrollable cost concepts are related to the authority of a person in the organisation. An expenditure which may be uncontrollable by one person may be controllable by another. Moreover, in the long run all costs might be controllable.

Question 8

(a) Describe briefly the role of the cost accountant in a manufacturing organisation.

(b) Distinguish between:

(i) Variable cost and direct cost

(ii) Estimated cost and standard cost.

Answer

(a) Cost accountant in a manufacturing organisation plays several important roles. He establishes a Cost Accounting department in his concern. He ascertains the requirement of cost information which may be useful to organisational mangers at different levels of

the hierarchy. He develops a manual, which specifies the functions to be performed by the Cost Accounting department. The manual also contains the format of various forms which would be utilised by the concern for procuring and providing information to the concerned officers. It also specifies the frequency at which the cost information would be supplied to a concerned executive.

Usually, the functions performed by a Cost Accounting department includes cost ascertainment, cost comparison, cost reduction, cost control and cost reporting.

Cost ascertainment, requires the classification of costs into direct and indirect. Further it requires classification of indirect costs (known as overheads) into three classes viz, factory overheads; administration overheads and selling and distribution overhead. Cost accountant suggests the basis which may be used by his subordinates for carrying out the necessary classifications as suggested above.

Cost comparison is the task carried out by Cost Accountant for controlling the cost of the products manufactured by the concern. Cost Accountant of the concern establishes standards for all the elements of cost and thus a standard cost of the finished product. The standard cost so determined may be compared with the actual cost to determine the variances. Cost Accountant ascertains the reasons for the occurrence of these variances for taking suitable action.

Cost analysis may also be made by Cost Accountant for taking decisions like make or by and for reviewing the current performance.

Cost Accountant also suggests suitable techniques for the purpose of cost reduction/cost control, after carrying out a cost benefit analysis.

Cost Accountant also plays a key role in the preparation of Cost reports. These reports help the executives of a business concern in reviewing their own performance and in identifying the weak areas, where enough control measure may be taken in future.

In brief, one may say that there is hardly any activity in a manufacturing organisation with which a Cost Accountant is not directly associated in some form or the other.

(b) (i) Variable and direct cost:

A variable cost is a cost that changes in total in direct proportion to changes in the related total activity or volume. Cost of material is an example of variable cost.

Direct cost is a cost which can be identified either with a cost centre or with a cost unit. An example of direct cost is the allocation of direct materials to a department and then to the various jobs. All variable costs are direct-but each direct cost may not be variable.

(ii) Estimated cost and standard cost:

Kohler defines estimated costs as 'the expected cost of manufacture or acquisition, often in terms of a unit of product computed on the basis of information available in advance of actual production or purchase' Estimated cost are prospective costs since they refer to prediction of costs.

Standard Cost means a pre-determined cost. It attempts to show what the cost should be for clearly defined conditions and circumstances. Standard costs represent' planned cost of a product. They are expected to be achieved under a particular production process under normal conditions.'

Although pre-determination is the essence of both standard costs and estimated costs, but they differ from each other in the following respects:

(i) Difference in computation

(ii) Difference in emphasis

(iii) Difference in use

(iv) Difference in records

(v) Applicability

Question 9

Enumerate the main objectives of introduction of a Cost Accounting System in a manufacturing organisation. (Nov, 2002, 3 marks)

Answer

The main objectives of introduction of a Cost Accounting System in a manufacturing organization are as follows:

(i) Ascertainment of cost

(ii) Determination of selling price

(iii) Cost control and cost reduction

(iv) Ascertainment of profit of each activity

(v) Assisting in managerial decision making

Question 10

Write short notes on any two of the following?

(i) Conversion cost (ii) Sunk cost (iii) Opportunity cost *(May, 2003, 4 marks)*

Answer

(i) Conversion cost:

It is the cost incurred to convert raw materials into finished goods. It is the sum of direct wages, direct expenses and manufacturing overheads.

(ii) Sunk cost:

Historical costs or the costs incurred in the past are known as sunk cost. They play no role in the current decision making process and are termed as irrelevant costs. For

example, in the case of a decision relating to the replacement of a machine, the written down value of the existing machine is a sunk cost, and therefore, not considered.

(iii) Opportunity cost:

It refers to the value of sacrifice made or benefit of opportunity foregone in accepting an alternative course of action. For example, a firm financing its expansion plan by withdrawing money from its bank deposits. In such a case the loss of interest on the bank deposit is the opportunity cost for carrying out the expansion plan.

Question 11

Write short notes on Cost Centre *(May 1995, 4 marks)*

Answer

Cost Centre : It is defined as a location, person or an item of equipment or a group of these for which costs are ascertained and used for cost control. Cost centres are of two types viz, impersonal and personal.

A cost centre which consists of a location or an item of equipment or a group of these is called an impersonal cost centre. A cost centre which consists of a person or a group of person is known as a personal cost centre.

In a manufacturing concern there are two type of cost centres viz., production and service. Production cost centres are those where production activity is actually carried out whereas service cost centres are those sections which are ancillary and render service to production cost centres.

Question 12

Name the various reports (Elaboration not needed) that may be provided by the Cost Accounting Department of a big manufacturing company for the use of its executives.

(May, 1998, 5 marks)

Answer

Various reports that may be provided by the Cost Accounting Department of a big manufacturing Company for the use of its executives are as under:

(i) Cost Sheets

(ii) Statements of material consumption

(iii) Statements of labour utilisation

(iv) Overheads incurred compared with budgets

(v) Sales effected compared with budgets

(vi) Reconciliation of actual profit with estimated profit

(vii) The total cost of inventory carried

(viii) The total cost of abnormally spoiled work in factory and abnormal losses in stores

(ix) Labour turnover statements

(x) Expenses incurred on research and development compared with budgeted amounts.

Question 13

State the unit of cost and method of costing generally used for accounting purpose in the following cases:

(i) Brick-works *(ii) Bi-cycle*

(iii) Oil refining mill and *(iv) Road transport company*

(Nov, 1997, 2 marks)

Answer

Industry/Product	*Unit of cost*	*Method of Costing*
(i) Brick – works	1,000 bricks	Single or output
(ii) Bi-cycle	Each bicycle	Multiple
(iii) Oil refining mill	Per-Tonne	Process
(iv) Road transport company	Per-tonne-km	Operating

Question 14

What is meant by Profit Centre? *(Nov,1997, 4 marks)*

Answer

Profit Centre: It is defined as an activity centre of a business organisation. Chief of such a centre is fully responsible for all costs, revenues and profitability of its operation. The main objective of profit centre is to maximise the centre's profit. Creation of profit centres facilitates management control and implementation of the objectives of responsibility accounting. A profit centre may have a number of cost centres.

Question 15

What is meant by cost centre? *(May, 1997, Nov.,2002, 4 marks)*

Answer

Cost Centre

It is the smallest area of responsibility or segment of activity for which costs are accumulated. It can be defined as a location; person or an item of equipment or a group of these for which costs are ascertained and used for the purpose of cost control. Cost centres are of two types viz.., personal and impersonal.

Personal cost centre: It is a cost centre which consists of a person or a group of persons.

Impersonal cost centre: It is a cost centre which consists of a location or an item of equipment or a group of these.

In a manufacturing concern there are two types of cost centres viz., production and service cost centres.

Question 16

How does a production account differ from a cost sheet (May, 2000, 3 marks)

Answer

The following are the points of difference between a production account and a cost sheet.

(i) Production Account is based on double entry system whereas cost sheet is not based on double entry system.

(ii) Production Account consists of two parts. The first part shows cost of the component and total production cost. The second part shows the cost of sales and profit for the period. Cost Sheet presents the elements of costs in a classified manner and the cost ascertained at different states such as prime cost; works cost; cost of production; cost of goods sold; cost of sales and total cost.

(iii) Production Account shows the cost in aggregate and thus facilitates comparison with other financial accounts. Cost sheet shows the cost in a detailed and analytical manner which facilitates comparison of cost for the purpose of cost control.

(iv) Production Account is not useful for preparing tenders or quotations. Estimated cost sheets can be prepared on the basis of actual cost sheets and these are useful for preparing tenders or quotations.

Question 17

Discuss cost classification based on variability and controllability. (Nov, 2004, 4 marks)

Answer

Cost classification based on variability

Fixed cost – These are costs, which do not change in total despite changes of a cost driver. A fixed cost is fixed only in relation to a given relevant range of the cost driver and a given time span. Rent, insurance, depreciation of factory building and equipment are examples of fixed costs where the final product produced is the cost object.

Variable costs – These are costs which change in total in proportion to changes of cost driver. Direct material, direct labour are examples of variable costs, in cases where the final product produced is the cost object.

Semi-variable costs – These are partly fixed and partly variable in relation to output e.g. telephone and electricity bill.

Cost classification based on controllability

Controllable costs – Are incurred in a particular responsibility center and relate to a defined time span. They can be influenced by the action of the executive heading the responsibility center e.g. direct costs.

Uncontrollable costs – Are costs are influenced by the action of the responsibility center manager e.g. expenditure incurred by the tool room are controllable by the foreman in charge of that section, but the share of tool room expenditure which are apportioned to the machine shop are not controllable by machine shop foreman.

Question 18

Discuss the essential of a good cost accounting system? (May, 2004, 2 marks)

Answer

Essentials of a good cost accounting system:

- It should be tailor-made, practical, simple and capable of meeting the requirements of a business concern.
- The data used by the system should be accurate, otherwise it may distort the output of system.
- Cost of installing & operating the system should justify the results.
- Cost accounting system should have the support of top management of the concern.
- The system should have the necessary support from all the user's departments.

Question 19

Explain:

(i) Sunk Costs

(ii) Pre-production Costs

(iii) Research and Development Costs

(iv) Training Costs (Nov, 2000, 2 x 4 = 8 marks)

Answer

(i) *Sunk Costs:* These are historical costs which are incurred in the past. These costs were incurred for a decision made in the past and cannot be changed by any decision that will be made in future. In other words, these costs plays no role in decision making, in the current period. While considering the replacement of a plant, the depreciated book value of the old plant is irrelevant, as the amount is a sunk cost which is to be written off at the time of replacement.

(ii) *Pre-production Costs:* These costs forms the part of development cost, incurred in making a trial production run, preliminary to formal production. These costs are incurred when a new factory is in the process of establishment or a new project is undertaken or a new product line or product is taken up, but there is no established or formal production

to which such costs may be charged. These costs are normally treated as deferred revenue expenditure (except the portion which has been capitalised) and charged to the costs of future production.

(iii) *Research and Development Costs:* Research costs are the costs incurred for the discovery of new ideas or processes by experiment or otherwise and for using the results of such experimentation on a commercial basis. Research costs are defined as the costs of searching for new or improved products, new applications of materials, or improved methods, processes, systems or services.

Development costs, are the costs of the process which begins with the implementation of the decision to produce a new or improved product or to employ a new or improved method and ends with the commencement of formal production of that product by that method.

(iv) *Training Costs:* These costs comprises of – wages and salaries of the trainees or learners, pay and allowances of the training and teaching staff, payment of fees etc, for training or for attending courses of studies sponsored by outside agencies and cost of materials, tools and equipments used for training. Costs incurred for running the training department, the losses arising due to the initial lower production, extra spoilage etc. occuring while providing training facilities to the new recruits.

All these costs are booked under separate standing order numbers for the various functions. Usually there is a service cost centre, known as the Training Section, to which all the training costs are allocated. The total cost of training section is thereafter apportioned to production centers.

Question 20

Enumerate the factors which are to be considered before installing a system of cost accounting in a manufacturing organization. (Nov, 1999, 5 marks)

Answer

Factors which are to be considered before installing a system of cost accounting in a manufacturing organization are:

(i) The objectives of installing a system of cost accounting should be defined, that is whether the system is meant for control of cost or for price fixation

(ii) The organization of the company should be studied to understand the authority and responsibilities of the managers.

(iii) The technical aspects and flow process should be taken into consideration.

(iv) The products to be manufactured should be studied.

(v) The marketing set up to be looked into for devising suitable control reports.

(vi) The possibility of integrating cost accounting system with financial accounting system should be examined.

(vii) The procedure for collection and verification of reliability of the information should be studied.

(viii) The degree of details of information required at each level of management should be examined.

(ix) The maximum amount of information that would be sufficient and how the same should be secured without too much clerical labour, especially the possibility of collection of data on a separate printed form designed for each process; also the possibility of instruction as regards filling up of the forms in writing to ensure that these would be faithfully carried out.

(x) How the accuracy of the data collected can be verified? Who should be made responsible for making such verification with regard to each operation and the form of certification that should be given indicate verification that he has carried out.

(xi) The manner in which the benefits of introducing Cost Accounting could be explained to various persons in the concern, specially those incharge of production department and an awareness created for the necessity of promptitude, frequency and regularity in collection of costing data.

Question 21

You have been asked to install a costing system in a manufacturing company. What practical difficulties will you expect and how will you propose to overcome the same?

(May, 2004, 4 marks)

Answer

The practical difficulties with which a Cost Accountant is usually confronted with while installing a costing system in a manufacturing company are as follows:

(i) *Lack of top management support:* Installation of a costing system do not receive the support of top management. They consider it as an interference in their work. They believe that such, a system will involve additional paperwork. They also have a misconcept in their minds that the system is meant for keeping a check on their activities.

(ii) *Resistance from cost accounting departmental staff:* The staff resists because of fear of loosing their jobs and importance after the implementation of the new system.

(iii) *Non cooperation from user departments:* The foremen, supervisor and other staff members may not cooperate in providing requisite data, as this would not only add to their responsibilities but will also increase paper work of the entire team as well.

(iv) *Shortage of trained staff:* Since cost accounting system's installation involves specialised work, there may be a shortage of trained staff.

To overcome these practical difficulties, necessary steps required are:

- To sell the idea to top management – To convince them of the utility of the system.

- Resistance and non cooperation can be overcome by behavioral approach. To deal with the staff concerned effectively.
- Proper training should be given to the staff at each level
- Regular meetings should be held with the cost accounting staff, user departments, staff and top management to clarify their doubts / misgivings.

Question 22

Distinguish between controllable & uncontrollable costs? (Nov, 2001, 2 marks)

Answer

Controllable costs and Uncontrollable costs:

Controllable costs are the costs which can be influenced by the action of a specified member of the undertaking. Controllable costs incurred in a particular responsibility centre can be influenced by the action of the executive heading that responsibility centre.

Uncontrollable costs are the costs which cannot be influenced by the action of a specified member of an undertaking.

Question 23

Define Explicit costs. How is it different from implicit costs? (May, 2001, 2 marks)

Answer

Explicit costs: These costs are also known as out of pocket costs. They refer to those costs which involves immediate payment of cash. Salaries, wages, postage and telegram, interest on loan etc. are some examples of explicit costs because they involve immediate cash payment. These payments are recorded in the books of account and can be easily measured.

Main points of difference: The following are the main points of difference between explicit and implicit costs.

(i) Implicit costs do not involve any immediate cash payment. As such they are also known as imputed costs or economic costs.

(ii) Implicit costs are not recorded in the books of account but yet, they are important for certain types of managerial decisions such as equipment replacement and relative profitability of two alternative courses of action.

Question 24

(a) What are the essentials of a Cost Accounting System? (May, 1996, (6 marks)

(b) *Narrate the essential factors to be considered while designing and installing a Cost Accounting System. (May, 1996, 10 marks)*

Answer

(a) Essentials of a Good Cost Accounting System

The essential features of a good Cost Accounting system are as follows:

(i) The Cost Accounting System should be tailor made, practical, simple and capable of meeting the requirements of a business concern.

(ii) The method of costing should be suitable to the industry and serve its objectives.

(iii) The Costing System should receive co-operation and participation of executives from various departments.

(iv) The cost of installing and operating the system should justify the results.

(v) The system of costing should not sacrifice the utility by introducing meticulous and unnecessary details.

(vi) The system should consider the organisational structure of the business and it should be designed as a sub-system of the overall organisation.

(vii) There should be a harmonious relationship between costing and financial accounts departments. Unnecessary duplication should be avoided. A single integrated accounting system may be designed.

(viii) The system should provide adequate checks on ordering, receipts, stocking, issuing and recording of materials. The pricing method and the issue of materials should be efficient.

(ix) The costing system should ensure proper recording of worker's time and their wages. Wages should be determined from wage analysis sheets. Proper attention should be paid in preparing payrolls and in the payment of wages. The treatment of idle time, over-time and holiday-pay should not be overlooked.

(x) The cost accounting system should ensure that overheads are collected, accumulated, allocated and apportioned suitably.

(b) Essential factors for designing a cost accounting system

The essential factors to be considered while designing a Cost Accounting System are as follows:

(i) A thorough understanding of – Organisational structure; manufacturing procedure, and process; selling and distribution procedure; and type of cost information required.

(ii) Selection of a suitable costing technique (Standard or actual, marginal or absorption)

(iii) Pricing method suitable, for the material, to be issued to production.

(iv) Method suitable for booking labour cost on jobs.

(v) A sound plan should be devised for the collection, allocation, apportionment and absorption of overheads.

(vi) Deciding on ways of treating waste, scrap and idle time.

(vii) Designing of suitable forms to be used for collecting and dissemination of Cost data/information.

(viii) Introduction of budgetary control technique so that actual performance may be compared with budgetary figures, for measuring efficiency or performance.

Essential factors for installing a Cost Accounting System.

The essential factors for installing a Cost Accounting System are listed as below:

(i) The objectives of installing a Costing System and the expectations of the management from the system should be identified first. The system will be a simple one in the case of a single objective but will be an elaborate one in the case of multiple objectives.

(ii) It is important to ascertain the significant variables of the manufacturing unit which are amenable to control and affect the concern. For example, quite often the production costs control may be more important than control of its marketing cost. Under such a situation, the costing system should devote greater attention to control production cost.

(iii) A thorough study of the nature of business, its technical aspects, products, methods and stages of production should be made. This will help in selecting a proper method of costing.

(iv) A Study of the organisation structure, its size and layout etc., is also necessary. This is useful to management to determine the scope of responsibilities of various managers.

(v) The costing system should be evolved in consultation with the staff and should be introduced only after meeting their objections and doubts, if any. The co-operation of staff is essential for the successful operation of the system.

(vi) Details of the records to be maintained by the costing system should be carefully worked out. The degree of accuracy of the data to be supplied by the system should be determined.

(vii) The forms to be used by foreman, workers etc., should be standardised. These forms be suitably designed and must ensure minimum clerical work at all stages.

(viii) Necessary arrangements should be made for the flow of information/data to all concerned managers, at different levels, regularly and promptly.

(ix) Reconciliation of costs and financial accounts be carried out regularly, if they are maintained separately.

(x) The costing system to be installed should be easy to understand and simple to operate.

Question 25

What are the main objectives of Cost Accounting? *(May, 2001, 2 marks)*

Answer

The main objectives of Cost Accounting are as follows:

(i) Ascertainment of cost.

(ii) Determination of selling price.

(iii) Cost control and cost reduction.

(iv) Ascertainment of profit of each activity.

(v) Assisting management in decision making.

Question 26

Explain controllable and non-controllable costs with illustrations. (May, 2001,2 marks)

Answer

Controllable and non-Controllable costs

Controllable costs: These are the costs which can be influenced by the action of a specified person in an organisation. In every organisation, there are a number of departments which are called responsibility centres, each under the charge of a specified level of management. Costs incurred in these responsibility centres are influenced by he action of the incharge of the responsibility centre. Thus any cost that an organisational unit has the authority to incur may be identified as controllable cost.

Non-controllable costs: These are the costs which cannot be influenced by the action of a specified member of an undertaking. For example, expenditure incurred by the 'Tool Room' is controllable by the Tool Room Manager but the share of Tool Room expenditure, which is apportioned to the Machine Shop cannot be controlled by the manager of the Machine Shop.

However, the distinction between controllable and non-controllable costs is not very sharp and is sometimes left to individual judgment to specify a cost as controllable or non-controllable in relation to a particular individual manager.

Question 27

Discuss the four different methods of costing alongwith their applicability to concerned industry? (Nov, 1999, 4 marks)

Answer

Four different methods of costing along with their applicability to concerned industry have been discussed as below:

1. *Job Costing:* The objective under this method of costing is to ascertain the cost of each job order. A job card is prepared for each job to accumulate costs. The cost of the job is determined by adding all costs against the job it is incurred. This method of costing is used in printing press, foundries and general engineering workshops, advertising etc.
2. *Batch Costing:* This system of costing is used where small components/parts of the same kind are required to be manufactured in large quantities. Here batch of similar products is

treated as a job and cost of such a job is ascertained as discussed under 1, above. If in a cycle manufacturing unit, rims are produced in batches of 2,500 units each, then the cost will be determined in relation to a batch of 2,500 units.

3. *Contract Costing:* If a job is very big and takes a long time for its completion, then method used for costing is known as Contract Costing. Here the cost of each contract is ascertained separately. It is suitable for firms engaged in the construction of bridges, roads, buildings etc.
4. *Operating Costing:* The method of Costing used in service rendering undertakings is known as operating costing. This method of costing is used in undertakings like transport, supply of water, telephone services, hospitals, nursing homes etc.

Question 28

Distinguish between:

Marginal Costing and Differential Costing

Answer

Marginal Costing and Differential Costing

Marginal Costing is defined as the 'Ascertainment of marginal costs and of the effect on profit of changes in volume or type of output by differentiating between fixed costs and variable costs'.

Differential Costing is defined as the technique of costing which uses differential costs and/or differential revenues for ascertaining the acceptability of an alternative. The technique may be termed as incremental costing when the difference is increase in costs and decremental costing when the difference is decrease in costs. The main points of distinction between marginal costing and differential costing are as below:

(a) The technique of marginal costing requires a clear distinction between variable costs and fixed costs whereas no such distinction is made in the case of differential costing.

(b) In marginal costing, margin of contribution and contribution ratio are the main yard sticks for performance evaluation and for decision making whereas under differential costs analysis, differential costs are compared with the incremental or decremental revenue (as the case may be) for arriving at a decision.

(c) Differential cost analysis is possible in both absorption costing and marginal costing, where as marginal costing in itself is a distinct technique.

(d) Marginal cost may be incorporated in the cost accounting system whereas differential costs are worked out separately.

Question 29

Specify the methods of costing and cost units applicable to the following industries:

(i) Toy making

(ii) Cement

(iii) Radio

(iv) Bicycle

(v) Ship building

(vi) *Hospital* *(Nov, 1998, 3 marks)*

Answer

Industry	*Method of costing*	*Unit of cost*
(i) Toy making	Batch	Per batch
(ii) Cement	Unit	Per tonne or per bag
(iii) Radio	Multiple	Per Radio or per batch
(iv) Bicycle	Multiple	Per Bicycle
(v) Ship building	Contract	Per Ship
(vi) Hospital	Operating	Per Bed per day or Per patient per day

Question 30

How does a Production Account differ from a Cost Sheet *(Nov, 1998, 3 marks)*

Answer

The following are the points of difference between a Production Account and a Cost Sheet.

(i) Production Account is based on double entry system whereas cost sheet is not based on double entry system.

(ii) Production Account consists of two parts. The first part shows cost of the components and total production cost. The second part shows the cost of sales and profit for the period. Cost sheet presents the elements of costs in a classified manner and the cost is ascertained at different stages such as prime cost; works cost of production; cost of goods sold; cost of sales and total cost.

(iii) Production account shows the cost in aggregate and thus facilitates comparison with other financial accounts. Cost sheet shows the cost in detail and analytical manner which facilitates comparison of cost for the purpose of cost control.

(iv) Production accounts is not useful for preparing tenders or quotations. Estimated cost sheets can be prepared on the basis of actual costs sheets and these are useful for preparing tenders or quotations.

Question 31

A factory uses a job costing system. The following cost data are available from the books for the year ended 31st March, 1989:

	Rs.
Direct Material	*9,00,000*
Direct Wages	*7,50,000*
Profit	*6,09,000*
Selling and Distribution Overhead	*5,25,000*
Administrative Overhead	*4,20,000*
Factory Overhead	*4,50,000*

Required

(a) *Prepare a Cost Sheet indicating the prime cost, works cost, production cost, cost of sales and sales value.*

(b) *In 1989-90, the factory has received an order for a number of jobs. It is estimated that the direct materials is would be Rs. 12,00,000 and direct labour would cost Rs. 7,50,000. What would be the price for these jobs if the factory intends to earn the same rate of profit on sales, assuming that the selling and distribution overhead has gone up by 15%. The factory recovers factory overhead as a percentage of direct wages and administrative and selling and distribution overheads as a percentage of works cost, based on the cost rates prevalent in the previous year.*

Answer

(a) COST SHEET

For the jobs carried out by the concern for the year ending on 31st March, '89

	Rs.
Direct Material	9,00,000
Direct Wages	7,50,000
PRIME COST	16,50,000
Factory Overhead	4,50,000
WORKS COST	21,00,000
Administrative Overhead	4,20,000
PRODUCTION COST	25,20,000
Selling and Distribution Overhead	5,25,000
COST OF SALES	30,45,000

Profit	6,09,000
SALES VALUE	36,54,000

(b) COST SHEET

For the Jobs carried out during the year 1989-90

	Rs.
Direct Material	12,00,000
Direct Labour	7,50,000
PRIME COST	19,50,000
Factory Overhead	4,50,000
(Refer to Working Note-1)	
WORKS COST	24,00,000
Administrative Overhead	4,80,000
(Refer to Working Note-2)	
PRODUCTION COST [1]	28,80,000
Selling and Distribution Overhead	6,90,000
(Refer to Working Note-3)	
COSTS OF SALES	35,70,000
Profit	7,14,000
(Refer to Working Note-4)	
SALES VALUE	42,84,000

Working Notes

1. **Factory Overhead** = Percentage of direct wages
   (to be charged during 1989-90)

$$= \frac{\text{Factory overhead of } 1988-89}{\text{Direct wages}} \times 100$$

$$= \frac{\text{Rs.}4,50,000}{\text{Rs.}7,50,000} \times 100$$

= 60% of Direct Wages of 1989-90.

---

[1] *Production Cost here is a misnomer, infact Works Cost itself is the Production Cost.*

= 60% of Rs. 7,50,000

= Rs. 4,50,000.

2. **Administrative Overhead** = Percentage of Works Cost

(to be charged during 1989-90)

$$= \frac{\text{Administrative overhead of } 1988-89}{\text{Works cost of } 1988-89}$$

$$= \frac{\text{Rs. } 4,20,000}{\text{Rs. } 21,00,000} \times 100$$

= 20% of works cost of 1989-90

= 20% of Rs. 24,00,000

= Rs. 4,80,000

3. **Selling and Distribution Overhead** = Percentage of Works Cost

(to be charged during 1989-90)

$$= \frac{\text{Selling and Distribution Overhead of } 1988-89}{\text{Works cost of } 1988-89} \times 100$$

$$= \frac{\text{Rs. } 5,25,000}{\text{Rs. } 21,00,000} \times 100$$

= 25% of Works Cost of 1989-90

= 25% of Rs. 24,00,000

= Rs. 6,00,000

Total Selling and Distribution Overhead including 15% increase =Rs. 6,00,000+15% of Rs. 6,00,000 = Rs. 6,90,000.

4. **Profit (for 1989-90)**

At the rate of profit of 1988-89

$$= \frac{\text{Profit}}{\text{Sales value}} \times 100$$

$$= \frac{\text{Rs. } 6,09,000}{\text{Rs. } 36,54,000} \times 100$$

Rs. 36,54,000
= 16.67% of Sales Value
= 20% of Cost of Sales
= 20% of Rs. 35,70,000 = Rs. 7,14,000

Question 32

The books of Adarsh Manufacturing Company present the following data for the month of April, 1992.

Direct labour cost Rs. 17,500 being 175% of works overheads.

Cost of goods sold excluding administrative expenses Rs. 56,000.

Inventory accounts showed the following opening and closing balance:

	April 1	*April 30*
	Rs.	*Rs.*
Raw materials	*8,000*	*10,600*
Works in progress	*10,500*	*14,500*
Finished goods	*17,600*	*19,000*

Other data are :	*Rs.*
Selling expenses	*3,500*
General and administration expenses	*2,500*
Sales for the month	*75,000*

You are required to

(i) Compute the value of materials purchased

(ii) Prepare a cost statement showing the various elements of cost and also the profit earned.

Answer

(i) Computation of the value of materials purchased

	Rs.
Cost of goods sold	56,000
Add: Closing stock of finished goods	19,000
	75,000
Less: Opening stock of finished goods	17,600
Cost of goods manufactured	57,400

Add: Closing stock of works-in-progress	14,500
	71,900
Less: Opening stock of work-in-progress	10,500
Works Cost	61,400
Less: Factory Overhead: $\left(\frac{100}{175}\text{ of Direct Labour Cost}\right)$	10,000
Prime Cost	51,400
Less: Direct Labour	17,500
Raw materials consumed	33,900
Add: Closing stock of raw materials	10,600
Raw materials available	44,500
Less: Opening stock of raw materials	8,000
Value of materials purchased	36,500

(ii) Cost Statement Showing the various elements of Cost and Profit Earned

	Rs.
Raw material consumed	33,900
(Refer to Statement (I) above)	
Direct labour cost	17,500
Prime Cost	51,400
Add: Factory Overheads	10,000
Works Cost	61,400
Add: Opening Work-in-progress	10,500
	71,900
Less: Closing Work-in-progress	14,500
Cost of goods manufactured	57,400
Add: Opening stock-of finished goods	17,600
	75,000
Less: Closing stock of finished goods	19,000
Cost of Goods Sold	56,000
Add: General and administration expenses	2,500
Add: Selling expenses	3,500

Cost of Sales	62,000
Profit (Balance figure Rs. 75,000 – Rs. 62,000)	13,000
Sales	75,000

Question 33

Popeye Company is a metal and wood cutting manufacture, selling products to the home construction market. Consider the following data for the month of October, 2004.

	Rs.
Sandpaper	*5,000*
Material-handling costs	*1,75,000*
Lubricants and Coolants	*12,500*
Miscellaneous indirect manufacturing labour	*1,00,000*
Direct manufacturing labour	*7,50,000*
Direct materials, October 1, 2004	*1,00,000*
Direct materials, October 31, 2004	*1,25,000*
Finished goods, October 1, 2004	*2,50,000*
Finished goods, October 31, 2004	*3,75,000*
Work –in-process, October 1, 2004	*25,000*
Work-in-process, October 31, 2004	*35,000*
Plant-leasing costs	*1,35,000*
Depreciation-plant equipment	*90,000*
Property taxes on plant equipment	*10,000*
Fire insurance on plant equipment	*7,500*
Direct materials purchased	*11,50,000*
Sales revenues	*34,00,000*
Marketing promotions	*1,50,000*
Marketing salaries	*2,50,000*
Distribution costs	*1,75,000*
Customer-service costs	*2,50,000*

Required

(i) Prepare an income statement with a separate supporting schedule of cost of goods manufactured.

(ii) For all manufacturing items, indicate by V or F whether each is basically a variable cost or a fixed cost (where the cost object is a product unit). (Nov, 2004, 6+2=8 marks)

Answer

(i) Popeye company 'Schedule for cost of goods manufactured' for the month ending Oct 2004

	Rs.	*Rs.*
Direct materials		
Beginning Inventory	1,00,000	
Purchase of Direct Materials	11,50,000	
Cost of direct materials available for use	12,50,000	
Ending inventory	1,25,000	
Direct materials used		11,25,000(V)
Direct manufacturing labour		7,50,000(V)
Indirect manufacturing costs		
Sand Paper	5,000(V)	
Material-handling cost	1,75,000(V)	
Lubricants and coolants	12,500(V)	
Misc. indirect mfg labour	1,00,000(V)	
Plant leasing cost	1,35,000(F)	
Depreciation-plant & equipment	90,000 (F)	
Property tax-plant & equipment	10,000 (F)	
Fire insurance-plant & equipment	7,500 (F)	5,35,000
Manufacturing cost incurred during the month of October, 2004		24,10,000
Add: Op. work-in-progress		25,000
		24,35,000
Less: Cl. Work-in-progress		35,000
Cost of goods manufactured (to income statement)		24,00,000

(ii) Popeye Company : Income Statement for the month ending Oct 31,2004

	Rs.	*Rs.*
Revenues		34,00,000
Cost of goods sold:		
Beginning finished goods	2,50,000	
Cost of goods manufactured	24,00,000	
Cost of goods available for sale	26,50,000	
Ending finished goods	3,75,000	22,75,000
Gross Margin		11,25,000
Marketing, Distribution and Customer Service Costs:		
Marketing promotions	1,50,000	
Marketing salaries	2,50,000	
Distribution costs	1,75,000	
Customer service cost	2,50,000	8,25,000
Operating Income		3,00,000

Question 34

A fire occurred in the factory premises on October 31, 2003. The accounting records have been destroyed. Certain accounting records were kept in another building. They reveal the following for the period September 1, 2003 to October 31, 2003.

(i) Direct materials purchased	*Rs. 2,50,000*
(ii) Work in process inventory, 1.9.2003	*Rs. 40,000*
(iii) Direct materials inventory, 1.9.2003	*Rs. 20,000*
(iv) Finished goods inventory, 1.9.2003	*Rs. 37,750*
(v) Indirect manufacturing costs	*40% of conversion cost*
(vi) Sales revenues	*Rs. 7,50,000*
(vii) Direct manufacturing labour	*Rs. 2,22,250*
(viii) Prime costs	*Rs. 3,97,750*
(ix) Gross margin percentage based on revenues	*30%*
(x) Cost of Goods available for sale	*Rs. 5,55,775*

The loss is fully covered by insurance company. The insurance company wants to know the historical cost of the inventories as a basis for negotiating a settlement, although the settlement is actually to be based on replacement cost, not historical cost.

Required

(i) Finished goods inventory, 31,10,2003

(ii) Work-in-process inventory, 31.10.2003

(iii) Direct materials inventory, 31.10.2003 *(November, 2003, 3+3+2 = 8 marks)*

Answer

Working notes

1. Direct material inventory cost (used during the month):

= Prime cost – Direct manufacturing labour cost

= Rs. 3,97,750 – Rs. 2,22,250 = Rs. 1,75,500

2. Conversion and indirect manufacturing cost:

Conversion cost	= (Direct manufacturing cost + Indirect manufacturing cost)
But Indirect manufacturing cost	= 40% of conversion cost
Or Conversion cost	= Direct manufacturing cost + 40% of conversion cost
Or 0.60 conversion cost	= Direct manufacturing cost
Or Conversion cost	$= \frac{\text{Direct manufacturing cost}}{0.60}$
	$= \frac{\text{Rs. 2,22,250}}{0.60}$
	= Rs. 3,70,417
Or Indirect manufacturing cost	= 40% x Rs. 3,70,417
	= Rs. 1,48,167

3. Cost of goods manufactured

	Rs.
Cost of goods available for sale	5,55,775
Less: Finished goods 1.9.2003	37,750
Cost of goods manufactured	5,18,025

(i) Finished goods inventory, 31.10.2003

	Rs.
Sales revenue	7,50,000
Less: Gross margin	2,25,000
(30% of revenue)	
Cost of goods sold: (a)	5,25,000
Cost of goods available for sale: (b)	5,55,775
Finished goods inventory, 31.10.2003: {(b)– (a)}	30,775

(ii) Work-in-process inventory, 31.10.2003:

	Rs.
Prime cost	3,97,750
Add: Indirect manufacturing cost	1,48,167
(Refer to working note 2)	
Add: Opening work-in-process, 1.9.2003	40,000
Manufacturing cost to account for	5,85,917
Less: Cost of goods manufactured	5,18,025
Work-in-process inventory, 31.10.2003	67,892

(iii) Direct material inventory, 31.10.2003

	Rs.
Direct materials inventory, 1.9.2003	20,000
Add: Direct materials purchased	2,50,000
	2,70,000
Less: Direct material inventory (used during the month)	1,75,500
(Refer to working note 1)	
Direct material inventory, 31.10.2003	94,500

Question 35

A Company manufactures radios, which are sold at Rs. 1,600 per unit. The total cost is composed of 30% for direct materials, 40% for direct wages and 30% for overheads. An increase in material price by 30% and in wage rates by 10% is expected in the forthcoming year, as a result of which the profit at current selling price may decrease by 40% of the present profit per unit. You are required to prepare a statement showing current and future profit at present selling price.

How much Selling Price should be increased to maintain the present rate of profit?

(May, 2001, 4 marks)

Answer

Let X be the cost, Y be the profit and Rs. 1,600 selling price per unit of radio manufactured by a company. Hence

X + Y = 1,600 ------- (I)

Statement of present and future Cost of a radio

Particulars	*Present cost* *Rs.*	*Increase in cost (Rs.)*	*Anticipated future cost (Rs.)*
	(a)	*(b)*	*(c) = (a) + (b)*
Direct material	0.3 X	0.09 X	0.39 X
Direct labour	0.4 X	0.04 X	0.44 X
Overheads	0.3 X	--	0.30 X
Total	X	0.13 X	1.13 X

An increase in material price and wage rates resulted into a decrease in current profit by 40 percent at present selling price; therefore we have:

1.13 X + 0.6 Y = 1,600 ----------(ii)

On solving (I) and (ii) we get:

X = Rs. 1,207.55

Y = Rs. 392.45

Current profit Rs. 392.45 or 32.5% of cost

Future profit Rs. 235.47

Statement of revised selling price to maintain the present rate of profit

	Rs.
Direct material cost *(0.39 x Rs. 1,207.55)*	470.94
Direct labour cost *(0.44 x Rs. 1207.55)*	531.32
Overheads	362.27

(0.30 x Rs. 1.207.55)	_____
Total cost	1,364.53
Profit	443.47
(32.5% of total cost)	_____
Revised selling price	1,808.00

Question 36

In an engineering company, the factory overheads are recovered on a fixed percentage basis on direct wages and the administration overheads are absorbed on a fixed percentage basis on factory cost.

The company has furnished the following data relating to two jobs undertaken by it in a period:

	Job 101	*Job 102*
	Rs.	*Rs.*
Direct Materials	*54,000*	*37,500*
Direct Wages	*42,000*	*30,000*
Selling Price	*1,66,650*	*1,28,250*
Profit Percentage on total cost	*10%*	*20%*

Required:

(i) Computation of percentage recovery rates of factory overheads and administrative overheads.

(ii) Calculation of the amount of factory overheads, administrative overheads and profit for each of the two jobs.

(iii) Using the above recovery rates fix the selling price of job 103. The additional data being.

Direct Materials	*Rs. 24,000*
Direct Wages	*Rs. 20,000*
Profit Percentage on Selling Price	*12-1/2%*

(May, 1995, 16 marks)

Answer

(i) Let factory overhead recovery rate, as percentage of direct wages be F and administrative overheads recovery rate, as percentage of factory cost be A.

Factory Cost of Jobs:

Job 101 = Rs. 96,000 + Rs. 42,000F

Job 102 = Rs. 67,500 + Rs. 30,000F

Total Cost of Production of Jobs:

Job 101 = (Rs.96,000 + Rs.42,000F) + (Rs.96,000 + Rs.42,000F)A= Rs.1,51,500
Job 102 = (Rs.67,500+ Rs.30,000F) + (Rs.67,500 + Rs.30,000F)A = Rs.1,06,875
(Refer to Working Note)
On solving above relations:
F = 0.60 and A = 0.25

Hence percentage recovery rates of factory overheads and administrative overheads are 60% and 25% respectively.

Working Note:

	Job 101	*Job 102*
Total cost of production (Rs.)	1,51,300	1,06,875
$\frac{\text{Selling price}}{(100\% + \text{Percentage of profit})}$	*(Rs. 1,66,650/110%)*	*(Rs. 1,28,250/120%)*

(ii) Statement of jobs, showing amount of factory Overheads, administrative overheads and profit

	Job 101 Rs.	*Job 102* Rs.
Direct Materials	54,000	37,500
Direct Wage	42,000	30,000
Prime Cost	96,000	67,500
Factory Overheads		
60% of Direct Wages	25,200	18,000
Factory Cost	1,21,200	85,500
Administrative Overheads		
25% of Factory Cost	30,300	21,375
Total Cost	1,51,500	1,06,857
Profit (difference figure)	15,150	21,375
Selling Price	1,66,650	1,28,250

(iii) Selling price of Job 103

	Rs.
Direct Materials	24,000
Direct Wages	20,000
Prime Cost	44,000
Factory overheads (60% of Direct Wages)	12,000
Factory Cost	56,000
Administrative Overheads (25% of Factory Cost)	14,000
Total Cost	70,000
Profit Margin (difference figure)	10,000
Selling Price $\left[\frac{\text{Total cost}}{87.5\%}\right]$	80,000

Question 37

Distinguish between Controllable and Uncontrollable costs. (May, 2003, 2 marks)

Answer

Controllable costs and Uncontrollable costs: Direct costs comprising of direct labour, direct material, direct expenses and some of the overheads are generally controllable by shop floor management.

Uncontrollable costs are those costs which cannot be influenced by the action of a specified member of an undertaking e.g. share to tool room expenditure which is apportioned to machine shop is not to be controlled by the machine shop foreman.

Question 38

A manufacturing company has an installed capacity of 1,20,000 units per annum. The cost structure of the product manufactured is as under:

		Rs.
(i)	*Variable cost per unit -*	
	Materials	*8*
	Labour (Subject to a minimum of Rs. 56,010 per month)	*8*
	Overheads	*3*

(ii) Fixed overheads Rs. 1,68,750 per annum

(iii) Semi-variable overheads – Rs. 48,000 per annum at 60% capacity, which increase by Rs. 6,000 per annum for increase of every 10% of the capacity utilisation or any part thereof, for the year as a whole.

The capacity utilisation for the next year is estimated at 60% for two months, 75% for six months and 80% for the remaining part of the year. If the company is planning to have a profit of 25% on the selling price, calculate the selling price per unit. Assume that there are no opening and closing stocks. (Nov, 1997, 12 marks)

Answer

Statement of Selling Price and Profit

	Rs.
Material	7,12,000
89,000 units x Rs. 8 p.u.	
(Refer to working note 1)	
Labour cost	7,28,000
(Refer to working note 2)	
Variable overheads	2,67,000
(89,000 units x Rs. 3)	
Semi-variable overheads	60,000
(Refer to working note 3)	
Fixed overheads	1,68,750
Total cost	19,35,750
Add: Profit @ *25% of selling price or*	
33-1/3% on cost	6,45,250
Total sales value	25,81,000
Selling price per unit	29.00
(Rs. 25.81.000/89,000 units)	

Working notes

1. Capacity utilisation (for the next year)

   60% of capacity for first two months = 2 months×6,000 units = 12,000 units

75% capacity for next six months = 6 months× 7,500 units = 45,000 units

80% of capacity for the remaining four months = 4 months× 8,000 units = 32,000 units

Total capacity utilisation 89,000 units

Capacity utilisation = $\frac{89{,}000 \text{ units}}{1{,}20{,}000 \text{ units}} \times 100$ = 74-1/6 %

2. *Calculation of labour cost (subject to a minimum of Rs. 56,000 p.m.)*

	Rs.
Labour cost of first two months	
12,000 units x Rs. 8 = Rs. 96,000	
But minimum here is	1,12,000
Labour cost of next six months	
45,000 units x Rs. 8 = Rs. 3,60,000	3,60,000
Labour cost of last four months	
32,000 units x Rs. 8	2,56,000
Total labour cost	7,28,000

3. *Calculation of semi-variable overheads (per annum):*

	Rs.
Semi-variable overheads	48,000
at 60% capacity	
Semi-variable overheads for additional	
14-1/6% capacity are the same as that for	
20% of the capacity utilisation for the whole year	12,000
	60,000

Question 39

The following figures are extracted from the Trial Balance of Gogetter Co. on 30th September, 1986:

	Rs.	*Rs.*
Inventories :		
Finished Stock	*80,000*	
Raw Materials	*1,40,000*	

Work-in-Process	*2,00,000*	
Office Appliances	*17,400*	
Plant & Machinery	*4,60,500*	
Buildings	*2,00,000*	
Sales		*7,68,000*
Sales Return and Rebates	*14,000*	
Materials Purchased	*3,20,000*	
Freight incurred on Materials	*16,000*	
Purchase Returns		*4,800*
Direct Labour	*1,60,000*	
Indirect Labour	*18,000*	
Factory Supervision	*10,000*	
Repairs and Upkeep Factory	*14,000*	
Heat, Light and Power	*65,000*	
Rates and Taxes	*6,300*	
Miscellaneous factory expenses	*18,700*	
Sales commission	*33,600*	
Sales Travelling	*11,000*	
Sales Promotion	*22,500*	
Distribution Deptt—Salaries and Expenses	*18,000*	
Office Salaries and Expenses	*8,600*	
Interest on Borrowed Funds	*2,000*	
Further details are available as follows:		
(i) Closing Inventories :		
Finished Goods	*1,15,000*	
Raw Materials	*1,80,000*	
Work-in-Process	*1,92,000*	
(ii) Accrued expenses on		
Direct Labour	*8,000*	
Indirect Labour	*1,200*	
Interest on Borrowed Funds	*2,000*	

(iii) Depreciation to be provided on:

Office Appliances	*5%*
Plant and Machinery	*10%*
Buildings	*4%*

(iv) Distribution of the following costs:

Hear, Light and Power to Factory, Office and Distribution in the ratio 8:1:1.

Rates and Taxes two-thirds to Factory and one-third to Office.

Depreciation on Buildings to Factory, Office and Selling in the ratio 8:1:1.

With the help of the above information, you are required to prepare a condensed profit and loss statement of Gogetter Co. for the year ended 30th September, 1986 along with supporting schedules of:

(i) Costs of Sales.

(ii) Selling and Distribution Expenses,

(iii) Administration Expenses.

Answer

Profit and Loss Statement of Gogetter Company

for the year ended 30th September, 1986

	Rs.	*Rs.*
Gross Sales	7,68,000	
Less : Returns	14,000	7,54,000
Less: Cost of Sales		7,14,020
Refer to Schedule (i)		
Net Operating Profit:		39,980
Less: Interest on Borrowed Funds,		4,000
Net Profit.		35,980

(i) Schedule of Cost of Sales

	Rs.	*Rs.*
Raw Material		1,40,000
(Inventory op. Balance)		

Add: Material Purchased	3,20,000	
Freight on Material	16,000	
Less: Purchase Returns	4,800	3,31,200
Less: Closing Raw Material Inventories		1,80,000
Material used in production		2,91,200
Direct Labour		1,68,000
Factory Overheads		
Indirect Labour	19,200	
Factory Supervision	10,000	
Repairs and Factory Upkeep	14,000	
Heat, Light and Power	52,000	
Rates and Taxes	4,200	
Miscellaneous Factory Expenses	18,700	
Depreciation of Plant	46,050	
Depreciation of Buildings	6,400	1,70,550
Gross Works Cost		6,29,750
Add: Opening work-in-process Inventory		2,00,000
		8,29,750
Less: Closing work-in-process Inventory		1,92,000
Works Cost		6,37,750
Add: Administration Expenses *[See Schedule (iii)]*		18,870
Total Cost of output		6,56,620
Add: Opening Finished Goods Inventory		80,000
		7,36,620
Less: Closing finished goods inventory		1,15,000
Cost of production of goods sold		6,21,620
Add: Selling and Distribution Expenses *[See Schedule (ii)]*		92,400
Cost of Sales		7,14,020

(ii) Schedule of Selling and Distribution Expenses

	Rs.
Sales Commission	33,600
Sales Travelling	11,000
Sales Promotion	22,500
Distribution Deptt.- Salaries and Expenses	18,000
Heat, Light and Power	6,500
Depreciation of Buildings	800
	92,400

(iii) Schedule of Administration Expenses

	Rs.
Office Salaries and Expenses	8,600
Depreciation of Office Appliances	870
Depreciation of Buildings	800
Heat, Light and power	6,500
Rates and Taxes	2,100
	18,870

Question 40

The cost structure of an article the selling price of which is Rs. 45,000 is as follows:

Direct Materials	*50%*
Direct Labour	*20%*
Overheads	*30%*

An increase of 15% in the case of materials and of 25% in the cost of labour is anticipated. These increased costs in relation to the present selling price would cause a 25% decrease in the amount of profit per article.

Your are required

(1) To prepare a statement of profit per article at present, and

(2) The revised selling price to produce the same percentage of profit to sales as before.

Answer

Working Notes

1. Let 'x' be the total cost and 'y' be the profit for an article whose selling price is Rs. 45,000

   Hence x + y =Rs. 45,000 (A)

2. Statement Showing Present and anticipated cost per article

Item	*Present Cost*	*Increase*		*Anticipated cost*
	Rs.	*%*	*Rs.*	*Rs.*
(1)	(2)	(3)	(4)	(5)=(2) + (4)
Direct Material Cost	0.5x	15	0.075x	0.575x
Direct Labour	0.2x	25	0.050x	0.250x
Overheads	0.3x	--	--	0.300x
	x		0.125x	1.125x

3. The increase in the cost of direct material and direct labour has reduced the profit by 25 per cent (as selling price remained unchanged). The increase is cost and reduction in profit can be represented by the following relation:

   1.125x + 0.75y = Rs. 45,000 (B)

4. On solving relations (A) and (B) as obtained under working notes 1 and 3 above we get.

   We get

   x = Rs. 30,000

   y = Rs. 15,000

(a) Present Statement of Profit Per Article

	Rs.	*Rs.*
Direct Material Cost	0.5x	15,000
Direct Labour Cost	0.2x	6,000
Overheads	0.3x	9,000
Total Cost		30,000
Profit		15,000
Selling Price		45,000

Note: Profit as a percentage of Cost Price = 50%

(Rs. 15,000/Rs. 30,000) x 100

Profit as a percentage of Selling Price = 33-1/3%

(Rs. 15,000/Rs. 45,000) x 100

(b) Statement of Revised Selling Price

	Rs.	*Rs.*
Direct Material Cost	0.575x	17,250
Direct Labour Cost	0.250x	7,500
Overheads	0.300x	9,000
Total Anticipated Cost		33,750
Profit *(33-1/3% of selling price)*		16,875
Selling Price		50,625
(Rs. 33,750 x 100) 66.66		

Question 41

Two workmen, Vishnu and Shiva, produce the same product using the same material. Their normal wage rate is also the same. Vishnu is paid bonus according to the Rowan system, while Shiva is paid bonus according to the Halsey system. The time allowed to make the product is 100 hours. Vishnu takes 60 hours while Shiva takes 80 hours to complete the product. The factory overhead rate is Rs. 10 per man-hour actually worked. The factory cost for the product for Vishnu is Rs. 7,280 and for Shiva it is Rs. 7,600.

You are required:

(a) to find the normal rate of wages;

(b) to find the cost of materials ;

(c) to prepare a statement comparing the factory cost of the products as made by the two workmen.

Answer

Working Notes

1. Let X be the Cost of material and Y be the normal rate of wages per hour.

Factory Cost of Workman Vishnu

	Rs.	
Material Cost	X	
Wages	60Y	
Bonus	24Y	
$\left[\frac{40 \times 60}{100}\right]$ Y		
Overheads	600	
i.e.	X + 60Y + 24Y + Rs. 600 = Rs. 7,280	
Or	X + 84Y = Rs. 6,680	(i)

Factory Cost of Workman Shiva

	Rs.
Material Cost	X
Wages	80Y
Bonus	10Y
$\left[\frac{20 \times 50}{100}\right]$ Y	
Overheads	800
i.e.	X+ 80Y + 10Y + Rs. 800=Rs. 7,600
Or	X + 90Y = Rs. 6,800 (ii)

2. On solving the above relations (i) and (ii), the value of X and Y comes to Rs. 500/- and Rs.20 per hour.

3. Bonus paid to Vishnu = 24Y = Rs. 480

   Bonus paid to Shiva = 10Y = Rs. 200

   (a) The normal rate of wages comes to Rs. 20/- per hour (Refer to Working Notes (i) and (ii)

   (b) The cost of material comes to Rs. 5,000 on substituting the value of Y in either of the above relations (i) or (ii).

   (c) Comparative Statement of the Factory Cost of the product made by the two workmen.

	Vishnu	*Shiva*
	Rs.	*Rs.*
Material cost	5,000	5,000
Direct Wages	1200	1,600
	(60 x Rs. 20)	*(80 x Rs. 20)*
Bonus	480	200
(Refer to Working Note (3)		
Factory overhead	600	800
Factory cost	7,280	7,600

Question 42

A Ltd. Co. has capacity to produce 1,00,000 units of a product every month Its works cost at varying levels of production is as under:

Level	*Works cost per unit*
	Rs.
10%	*400*
20%	*390*

30%	*380*
40%	*370*
50%	*360*
60%	*350*
70%	*340*
80%	*330*
90%	*320*
100%	*310*

Its fixed administration expenses amount to Rs. 1,50,000 and fixed marketing expenses amount to Rs. 2,50,000 per month respectively. The variable distribution cost amounts to Rs. 30 per unit.

It can market 100% of its output at Rs. 500 per unit provided it incurs the following further expenditure:

(a) It gives gift items costing, Rs. 30 per unit of sale;

(b) It has lucky draws every month giving the first prize of Rs. 50,000; 2nd prize of Rs. 25,000 3rd prize of Rs. 10,000 and three consolation prizes of Rs, 5,000 each to customers buying the product.

(c) It spends Rs. 1,00,000 on refreshments served every month to its customers;

(d) It sponsors a television programme every week at a cost of Rs. 20,00,000 per month.

It can market 30% of its output at Rs. 550 per unit without incurring any of the expenses referred to in (a) to (d) above.

Advise the company on its course of action. Show the supporting cost sheets.

(Nov, 1998, 12 marks)

Answer

Cost Sheet (for the month)

Level of capacity	30%		100%	
Level of output Produce (Units)	*30,000*		*1,00,000*	
	Per Unit (Rs.)	*Total (Rs.)*	*Per Unit (Rs.)*	*Total (Rs.)*
Works cost	380.00	1,14,00.000	310,00	3,10,00,000
Add: Fixed administration expenses	5.00	1,50,000	1.50	1,50,000
Cost of production	385.00	1,15,50,000	311,50	3,11,50,000
Add: Fixed marketing expenses	8.33	2,50,000	2.50	2,50,000
Add: Variable distribution cost	30.00	9,00,000	30.00	30,00,000
Add: Special cost				
Gift items cost	–	–	30.00	30,00,000
Customer's prizes	–	–	1.00	1,00,000

Refreshments	–	–	1.00	1,00,000
Television programme sponsorship cost	–	–	20.00	20,00,000
Cost of sales	423.33	1,27,00,000	396.00	3,96,00,000
Profit	126.67	23,00,000	104.00	1,04,00,000
Sale revenue	550.00	1,50,00,000	500.00	5,00,00,000

Advise to the company about the course of action to be taken.

The profit of A Ltd. Co. is more by Rs. 81 lacs (Rs. 104 lacs – Rs. 23 lacs), if uses its capacity to produce 1,00,000 units of a product per month. Hence, it is advisable to the Company to produce 1,00,000 units and incur the special costs for the marketing of its 100% output.

Question 43

Conversion Cost and Added Value.

Answer

Conversion cost is the production cost excluding the cost of direct material (but including the cost resulting fro variations in direct material, weight or volume) of producing partly or fully finished products. In other words, conversion cost of finished product or work in-progress is comprised of direct labour and the manufacturing overhead.

Added value means the charge in market value resulting from an alteration in the form, location or availability of a product of service, excluding the cost of bought out materials or services. Unlike conversion cost, it includes profit.

Question 44

A re-roller produced 400 metric tons of M.S. bars spending Rs. 36,00,000 towards materials and Rs. 6,20,000 towards rolling charges. Ten percent of the output was found to be defective, which had to be sold at 10% less than the price for good production. If the sales realization should give the firm an Overall profit of 12.5% on cost, find the selling price per metric ton of both the categories of bars. The scrap arising during the rolling process fetched a realization of Rs. 60,000. *(6 Marks)*

Answer

Computation of Selling Price

	Rs.		
Cost of Materials	36,00,000		
Less: Scrap	60,000	Rs.	35,40,000
Rolling charges			6,20,000

Total cost		41,60,000
Add Profit (12.5% on cost)		5,20,000
Sales value	Rs.	46,80,000

Output (effective)

$$360 \text{ tons} + \frac{9}{10} \times 40 \text{ tons} = 396 \text{ tons}$$

Selling price per MT of good output

= Rs. 46,80,000/396

= Rs. 11,818.18

Selling price of defective per MT

= 0.9× Rs. 11,818.18 = Rs. 10,636.36

Question 45

XYZ Auto Ltd. is in the business of selling cars. It also sells insurance and finance as part of its overall business strategy. The following information is available for the company.

	Physical Units	*Sales Value*
Sales of Cars	*10,000 Cars*	*Rs. 30,000 lacs*
Sales of Insurance	*6,000 Policies*	*Rs. 1,500 lacs*
Sales of Finance	*8,000 Loans*	*Rs. 19,200 lacs*

The Revenue earnings from each line of business before expenses are as follows:

Sale of Cars	*3% of Sales value*
Sale of Insurance	*20% of Sales value*
Sale of Finance	*2% of Sales value*

The expenses of the company are as follows:

Salesman salaries	*Rs. 200 lacs*
Rent	*Rs. 100 lacs*
Electricity	*Rs. 100 lacs*
Advertising	*Rs. 200 lacs*

Documentation cost per insurance policy *Rs. 100*

Documentation cost for each loan *Rs. 200*

Direct sales expenses per car *Rs. 5,000*

Indirect costs have to be allocated in the ratio of physical units sold.

Required:

(i) Make a cost sheet for each product allocating the direct and indirect costs and also showing the product wise profit and total profit.

(ii) Calculate the percentage of profit to revenue earned from each line of business.

(6 + 8 = 14 marks)

Answer

Product Cost Sheet

	Total	Cars	Insurance	Finance
Sales units		10,000	6,000	8,000
Sales value (Rs in lakhs)		30,000	1,500	19,200
Revenue earnings		3%	20%	2%
Revenue earned (Rs in lakhs)	1584	900	300	384
Direct costs (Rs in lakhs)	522	500*(5000 × 10000)*	6*(100 × 6000)*	16 *(200 × 8000)*
Indirect costs (allocated in the ratio of physical units sold) 0.4167:0.25:0.3333				
Salesman salaries (Rs in lakhs)	200			
Rent (Rs in lakhs)	100			
Electricity (Rs in lakhs)	100			
Advertising (Rs in lakhs)	200			
	600	250	150	200
Total costs	**1122**	**750**	**156**	**216**
Profits (Revenue – Total cost)	462	150	144	168
% of Profits to revenue earned	29.17%	16.67%	48%	43.75%

Question 46

A Manufacturing Company has an installed capacity of 1,50,000 units per annum. Its cost structure is given below:

		Rs.
(i)	*Variable cost per unit*	
	Materials	*10*
	Labour (subject to a minimum of Rs. 1,00,000 per month)	*10*
	Overheads	*4*
(ii)	*Fixed overheads per annum*	*1,92,300*
(iii)	*Semi-variable overheads per annum at 75% capacity (It will increase by Rs. 4,000 per annum for increase of every 5% of the capacity utilisation or any part thereof)*	*60,000*

The capacity utilisation for the next year is budgeted at 75% for first three months, 80% for the next six months and 90% for the remaining three months.

Required:

If the company is planning to have a profit of 20% on the selling price, calculate the selling price per unit for the next year.

Answer

Working Notes:

(i) Installed capacity per month $\frac{1,50,000}{12}$ =12,500 units

(ii) **Capacity utilisation**	75%	80%	90%
Production per month (units)	9,375	10,000	11,250
Total production (units)	3×9,375 = 28,125	10,000 ×6 = 60,000	11,250 ×3 = 33,750
Total	1,21,875 units		

(iii) **Calculation of labour cost:**

Capacity	**75%**	**80%**	**90%**
Production per month (units)	9,375	10,000	11,250
Labour @ 10 (subject to minimum 1,00,000)	93,750 i.e. minimum 1,00,000	1,00,000	1,12,500
Total labour cost	3×1,00,000 = 3,00,000	6 ×1,00,000 = 6,00,000	3 ×1,12,500 = 3,37,500
Total	Rs 12,37,500		

(iv) **Calculation of semi variable overheads:**

	75%	80%	90%
Semi variable Overhead per month	$\frac{60,000}{12} = 5,000$	$\frac{60,000 + 4,000}{12} = 5333.66$	$\frac{60,000 + 12,000}{12} = 6,000$
Total Semi-variable Overhead	$3 \times 5,000 = 15,000$	$6 \times 5333.66 = 32,000$	$3 \times 6,000 = 18,000$

Total Rs. 65,000

Calculation of selling price per unit:

	Rs.
Material costs 1,21,875 @ 10	12,18,750
Labour cost	12,37,500
Overheads 1,21,875 @ 4	4,87,500
Semi-variable Overheads	65,000
Fixed Overheads	1,92,300
Total cost	32,01,050
Profit 20% on selling price i.e., 25% on cost	8,00,262.50
Sales	40,01,312.50
Selling price/unit = $\frac{40,01,312.50}{1,21,875}$	Rs. 32.83

Question 47

Answer any the following:

(i) Explicit and Implicit Costs *(May 2007, 2 marks)*

(ii) Period Costs and Discretionary Costs *(May, Nov, 2007, 2 marks)*

Answer

(i) Explicit and Implicit cost:

Explicit costs, which are also known as out of pocket costs, refer to costs involving immediate payment of cash. Salaries, wages, interest on loan etc. are examples of explicit costs. They can be easily measured.

The main points of difference between explicit and implicit costs are:

- Implicit costs do not involve immediate cash payment.
- They are not recorded in the books of account.
- They are also known as economic costs.

(ii) Period and Discretionary costs

There are the costs, which are not assigned to the products but are charged as expenses against the revenue of the period in which they are incurred. All non-manufacturing costs such as general and administrative expenses, selling and distribution expenses are period costs.

Such costs are not tied to a clear cause and effect relationship between inputs and outputs. They arise from periodic decisions regarding the maximum outlay to be incurred. Examples are – advertising, public relations, training etc.

Question 48

Explain Profit centres and investment centres. *(Nov, 2008, 2 Marks)*

Answer

Profit Centres and Investment Centres:

Centres which have the responsibility of generating and maximizing profits are called profit centres.

Those centres which are concerned with earning an adequate return on investment are known as Investment centres.

2
Materials

Question 1

List five types of inefficiency in the use of materials that may be discovered as the result of investigating material quantity variances. What measures may be taken in each such situation to prevent their recurrence?

Answer

The five types of inefficiency in the use of materials that may be discovered as a result of investigating materials quantity variances are as follows:

1. Purchase of inferior quality of materials.
2. Inefficient labour force leading to excessive utilisation of materials.
3. Defective machines, tools and equipments and bad or improper maintenance leading to breakdowns resulting in excessive usage of materials.
4. Inaccurate technical specifications and slackness in inspection may cause more rejections, resulting in greater requirement of materials for rectification of defects.
5. Faulty material processing.

The measures which may be taken in each of the above situations to prevent their recurrence in future are as below:

1. To ensure the purchase of proper quality of material, each lot of material purchased should be inspected in accordance with the terms and conditions of purchase before they are accepted and issued for production. The extent of inspection may depend on the circumstances. For instance, when materials are of small value or where the quality of raw materials does not appreciably affect the final product, the inspection may not be very rigid. In such a case, inspection may be carried out by taking random samples. However, for materials of vital importance like raw materials for explosive factories or for pharmaceutical concerns where material cost is high, a rigid or strict inspection will be necessary.
2. Labour inefficiency can be reduced by adopting following measures:
   (a) Imparting on-the-job training to workers.
   (b) Supervising the workers while performing the jobs.

(c) Evaluating workers performance.

(d) Incorporating incentive schemes for workers.

(e) Reducing labour turnover ratio.

3. The wastage of material can also be reduced by properly maintaining machines, tools and other equipment. The concern should adopt a policy of preventive maintenance. The use of such a policy will reduce machine down time and over-consumption of materials. Besides this, workers must be educated to realise fully the importance of tools and equipment in their day-to-day work.

4. A reduction in the number of defective units, in this case may automatically bring down the excessive consumption of material required for rectification of defects. Reduction in the number of defectives can be achieved by laying down accurate technical specifications, standards for materials and tactfully handling the problem of slackness.

5. Faulty material processing also results in excess consumption of material. The supervisors at the shop floor level should educate and guide the workers properly so that they make use of the correct procedure laid down for processing raw materials.

Question 2

Many businesses have an unnecessarily large amount of capital locked up in the raw materials and work-in-progress. Indicate methods of correcting this position.

Answer

The problem of unnecessary locking up of the funds in raw materials and work-in-progress can be solved by adopting the following methods:-

1. *Budgeting materials requirements:* To control investment in raw materials it is necessary to know in advance about the materials requirement during a specific period, usually a year. The exact quantity of materials and the time when they would be required can be known by studying carefully production plans and production schedules. Based on this, materials requirement budget can be prepared. Such a budget will discourage the unnecessary investment in raw materials . This budget may also be used as a basis to assess the performance of executives with regard to investment in raw materials.

2. *ABC Analysis :* The technique of ABC analysis also helps in a big way in overcoming the problem of unnecessary locking up of the funds in raw materials. Under this method all the raw materials are generally classified into three categories A, B & C on the basis of their use value. The costliest items are placed under A Category. These items are controlled by top executives whereas B and C category of items may be controlled by middle level and lower level executives respectively. This classification helps in ensuring that unnecessary funds are not blocked in raw materials particularly in A category items because of their high value. In fact, ABC analysis is a method which clearly indicates the items of raw materials to be controlled by managers at different levels. These managers also ensure a proper decision with regard to investment in raw materials in respect of the items falling in their domain.

3. *Fixation of raw material levels:* To avoid unnecessary locking up of funds in raw materials, it is desirable to fix up various levels like re-order level, maximum level, minimum level, safety stock, economic order quantity etc. Such levels may be fixed up after taking into account the factors like rate of consumption, lead time, ordering cost, handling cost etc. This method of stock control, besides avoiding unnecessary locking up of capital in raw materials, reduces total inventory costs which include inventory carrying costs and ordering costs.

4. *Control over slow-moving and non-moving items:* Sometimes, due to high value of slow moving and non-moving raw materials, it appears that the concern has blocked huge sum of money unnecessarily in raw materials. To overcome this problem, it is necessary to dispose-off as early as possible the non-moving items or make arrangements for their exchange with the raw materials required by the concern. Besides this, no new requisition should be made for the purchase of slow moving items, till the existing stock is exhausted. Computation of inventory turnover ratio may help in identifying slow moving items.

5. *Variety reduction:* Huge investments are sometime made for the purchase of the same raw material under different brand names to cater to the needs of different user departments. Significant reduction in investment can be brought about by selecting a particular brand/variety of raw material suitable for all the user departments. Under this method instead of purchasing a number of brands, say ten brands of the same material, the decision may be taken to purchase less number of brands, say one or two. Such a decision would minimise unnecessary locking up of funds in raw materials.

6. *Codification of materials:* It has been observed that the same material used by different departments is also named differently by them. Due to this, for the same material, the purchase department places different orders and the stores department stores it at different places. Even the accounts for these materials are maintained separately. Such a practice results in the unnecessary locking up of funds. Here the excessive investment in raw materials can be reduced by resorting to the technique known as "Codification of materials". Under codification a code may be assigned to each material. The assigned code should be used henceforth for requisitioning the material from stores by different departments instead of its name.

7. *Control of work-in-progress:* The investment in work-in-progress depends upon the number and sequences of the processes and sub-assemblies and the length of the production cycle. A system of efficient production planning and scheduling would assist in maintaining an uninterrupted flow of work and reducing the length of the production cycle. It will ultimately avoid unnecessary locking up of the funds in WIP inventory.

Question 3

Discuss briefly how the following items are to be treated in costs:-

(i) Carriage inwards raw materials

(ii) Storage losses

(iii) Cash discount received

(iv) Insurance costs on stocks of raw materials.

Answer

(i) Carriage inwards on raw materials: It represents the expenditure incurred in bringing raw materials to factory from outside. This expense is directly allocated to materials and thus forms a part of the .cost of such materials. When this is not practicable and allocation to specific items of materials is difficult, the expense is treated as manufacturing overhead and is charged to cost of production at a predetermined rate. In some of the undertakings the practice is to charge these expenses as a percentage of cost, weight or some other physical unit of material.

(ii) Storage losses*:* The losses arising out of storage of material can be classified into two categories. The treatment of losses under each category in Cost Accounts is as under:-

(a) Losses due to reasons like evaporation, shrinkage, absorption and moisture, etc. are considered as normal losses. Such losses are absorbed by good production units by inflating the cost of material issued for production.

(b) Losses due to fire, flood, storm, theft etc. are treated as abnormal losses. If these losses are heavy and are not recoverable from the insurance authorities, it is preferred to charge them to Costing Profit and Loss Account.

(iii) Cash discount received: It is an allowance given by the vendor for prompt payment of material price. The opinion among accountants about its treatment differs. Two prevalent approaches for treating the cash discount received are as follows:-

(a) The cash discount received in the course of materials buying should be deducted from the invoice price of the materials. This way the discount received will reduce the purchase price of the materials.

(b) It may be treated as an item of financial nature and therefore be kept outside the purview of cost accounting. However, it can be dealt in the following manner.

The full invoice price should be charged to the material account crediting the suppliers with the net invoice price, and the discount earned account with the amount of cash discount received. If the prompt payment could not be made, the discount lost is debited to the discount lost account. Any difference between the discount earned and discount lost may be treated as an item of administrative overhead.

(iv) Insurance costs on stocks of raw materials: The amount paid as insurance costs (insurance premium) on stocks of raw materials is meant for covering the risk which may arise due to fire, theft, riot etc. The insurance cost is apportioned over different materials on the basis of their value. This cost may be charged directly to the cost of material.

Question 4

Distinguish between spoilage and defectives in a manufacturing company. Discuss their treatment in cost accounts and suggest a procedure for their control.

Answer

Spoilage can be defined as the materials which are badly damaged in the course of manufacturing operations to the extent that they cannot be rectified economically and hence taken out of process, to be disposed of in some manner without further processing. Spoilage may be either normal or abnormal.

Defective products are such semi-finished or finished products produced by a manufacturing unit, which are not in conformity with laid-down standard or dimensional specifications. Defectives produced can be re-worked or reconditioned by the application of additional materials, labour and/or processing and brought to the point of either standard or sub-standard product. The costs incurred for reconditioning are known as the "Costs of re-operations of the defectives". Defective production may be the result of various causes such as sub-standard materials, bad-workmanship, carelessness in planning, laxity in inspection etc.

The difference between spoilage and defectives is that while spoilage cannot be repaired or reconditioned, defectives can be rectified and transformed, either back to standard production or to seconds.

Treatment of spoilage and defectives in Cost Accounting: Under Cost Accounts normal spoilage costs (i.e., which is inherent in the operation) are included in cost either by charging the loss due to spoilage to the production order or charging it to production overhead so that it is spread over all products. Any value realised from the sale of spoilage is credited to production order or production overhead account, as the case may be. The cost of abnormal spoilage (i.e. arising out of causes not inherent in manufacturing process) are charged to the Costing Profit and Loss Account. When spoiled work is the result of rigid specifications the cost of spoiled work is absorbed by good production while the cost of disposal is charged to production overheads.

The problem of accounting for defective work is the problem of accounting of the costs of rectification or rework.

The possible ways of treatment are as below:

(i) Defectives that are considered inherent in the process and are identified as normal can be recovered by using the following methods:

  (a) *Charged to good products:* The loss is absorbed by good units. This method is used when 'seconds' have a normal value and defectives rectified into 'seconds' or 'first' are normal.

  (b) *Charged to general overheads :* When the defectives caused in one department are reflected only on further processing, the rework costs are charged to general overheads.

(c) *Charged to the departments overheads:* If the department responsible for defectives can be identified then the rectification costs should be charged to that department.

(d) *Charged to Costing Profit and Loss Account:* If defectives are abnormal and are due to causes beyond the control of organisation; the rework cost should be charged to Costing Profit and Loss Accounts.

(ii) Where defectives are easily identifiable with specific jobs the re-work costs are debited to the job.

Procedure for the control of Spoilage and Defectives : To control spoilage, allowance for a normal spoilage should be fixed up and actual spoilage should be compared with standard set. A systematic procedure of reporting would help control over spoilage. A spoilage report (as below) would highlight the normal and abnormal spoilage, the department responsible, the causes of spoilage and the corrective action taken if any.

Spoilage Report

Units/Deptt. No..... Date.....

Production Order No.....

Units Produced	*Units spoiled*	*Normal spoilage*		*Abnormal spoilage*		*Cost of abnormal spoilage Rs.*	*Reason for spoilage*	*Action taken*
		Qty.	*%*	*Qty.*	*%*			

Control of defectives may cover the following two areas :

(a) Control over defectives produced

(b) Control over reworking costs.

For exercising effective control over defectives produced and the cost of reworking, standards for normal percentage of defectives and reworking costs should be established.

Actual performance should be compared with the standards set. Defective Work Report (as shown below:) should be fed back to the respective centres of control.

Defective Work Report

Dept. ..... Date: .....

Causes of defects .....

Nature of defects .....

Job/ Process No.	*Defective*		*Detail of work to be done*	*Re-work Costs*				*Unit cost of Re-working Rs.*	*Net good output after re-working*
	Normal	*Abnormal*		*Materials Rs.*	*Labour Rs.*	*OV Rs.*	*Total Ts.*		

Question 5

What are the conditions that favour the adoption of last-in first-out system of materials pricing? Explain its working and indicate its advantages and limitations.

Answer

The conditions that favours the use of last-in first-out method of materials pricing are the following:

1. During a period of substantial price rise - the use of LIFO method of pricing would help to ensure that the cost of production determined is approximately the current one.
2. When there is a feeling that due to use of FIFO or average methods the profit shown and tax paid are too high.

LIFO-Last in first out - is a method of pricing the issues of materials. This method is based on the assumption that the items of the last batch (lot) purchased are the first to be issued. Therefore, under this method the price of the last batch (lot) is used for pricing the issues, until it is exhausted and so on. If however, the quantity of issue is more than the quantity of the latest lot, price of earlier (lot) will also be taken into consideration. Consider the following example :

Last-in-First-Out

Date	*Receipt*		*Issue*		*Balance*	
	Qty. Kg.	*Rate Rs.*	*Qty. Kg.*	*Rate Rs.*	*Qty. Kg.*	*Rate Rs.*
1.6.82	200	5	-	-	200	5
2.6.82	300	6	-	-	200	5
3.6.82			400 { 300	6	300	6
			{ 100	5	100	6

The advantages of using LIFO are as follows :

(i) The cost of the materials used is nearer to the current market price. Thus the cost of goods produced depends upon the trend of the market price of materials. This enables the matching of cost of production with current sales revenues.

(ii) Use of LIFO during the period of rising prices does not depict unnecessarily high profit in the income statement; compared to the first in first out or average methods, the profit shown is relatively lower, because the cost of production takes into account the rising trend of material prices.

(iii) Under the LIFO method when prices of materials fall, no doubt profits tend to rise due to lower material cost, yet the finished product appears to be more competitive and at market prices.

(iv) Over a period, the use of LIFO helps to iron out the fluctuations in profits.

(v) In a period of inflation, LIFO will tend to show the correct profit and thus avoid paying unduly high taxes to some extent.

The limitations of the LIFO system :

(1) Calculations under LIFO system become complicated and cumbersome when frequent purchases are made at highly fluctuating rates.

(2) Costs of different similar batches of production carried on at the same time may differ a great deal.

(3) In times of falling prices, there will be need for writing off stock values considerably to stick to the principle of stock valuation i.e at cost or the market price whichever is lower.

(4) This method of valuation is not acceptable to the Income Tax Authorities.

Question 6

Define (i) Replacement Price and (ii) Standard Price. Discuss the objectives of these methods of pricing of materials and state the circumstances in which they are used.

Answer

(i) Replacement Price is defined as the price at which it is possible to purchase an item, identical to that which is*being replaced or revalued.

(ii) A Standard Price may be defined as a predetermined price fixed for a specified period on the basis of all factors which may affect future price.

Under Replacement Price method, materials issued are valued at the replacement costs of the items. This method pre-supposes the determination of the replacement cost of the materials at the time of each issue, viz., the cost at which identical materials could be currently purchased. The product cost under this method is at current market price which is the main objective of the replacement price method.

Replacement Price method is used to value material issues in periods of rising prices because the cost of material considered in cost of production would be able to replace the materials at the increased price. This method is used to find the true cost of production

The fixation of Standard Price takes into account the quantity of materials to be purchased, possibility of price fluctuations, etc. The Standard Price is used for comparison with actual prices from period to period and to measure the efficiency of the purchase of materials. This is used in conjunction with Standard Costing System for control purposes and is a tool to the management if fluctuations in prices are not violent.

Question 7

Explain the distinction between waste and scrap in the manufacturing process. Discuss their treatment in cost accounts and suggest a procedure for control.

Answer:

Waste : It represents that portion of basic raw materials, which is either lost or which evaporates or shrinks during a manufacturing process. It may be visible or invisible. But it has no recovery value.

Scrap : The incidental residue arising from the manufacturing operations, small in quantity and .low in value, recoverable without further processing.

From the definitions of waste and scrap stated above it is quite apparent that waste cannot be realised whereas scrap can be. Scrap is always visible whereas waste may or may not be.

Waste can be differentiated as normal and abnormal. Normal waste is absorbed in the cost of net output, whereas abnormal waste is transferred to the Costing Profit and Loss Account.

For effective control of waste, normal allowances for yield and waste should be made from past experience, technical factors and special features of the material process and product. Actual yield and waste should be compared with anticipated figures and appropriate actions should be taken where necessary. Responsibility should be fixed on purchasing, storage, maintenance, production and inspection staff to maintain quality of the materials and other standards. A systematic procedure for feedback of Achievements against standards laid should be established.

Scrap may be treated in Cost Accounts in the following ways :

(i) Where the value of scrap is negotiable, it may be excluded from costs. In other words, the cost of scrap is borne by good units and income from scrap is treated as other income.

(ii) If the scrap value is considerable, the net sale proceeds of scrap (Gross sales proceeds of scrap—the cost of selling scrap) is deducted from the material cost or factory overhead. Under this method the material cost or factory overhead recovery rate are

reduced on account of sale proceeds of scrap. However, no distinction is made between various processes or jobs.

(iii) Where the various jobs or processes give rise in varying amount of scrap, the scrap from each job or process is recorded separately and the sale proceeds from the same credited to the particular job or process. This method is useful where scrap is of considerable value and does not arise uniformly. However, this would necessitate the scrap being identified with various jobs or processes. For this purpose detailed records for scrap will be required.

Control of scrap really arises at the maximum effective utilization of the raw material. Scrap control does not, therefore, start in the production department; it starts from the stage of product designing. Thus the most suitable type of materials, the appropriate size, the right type of equipment and personnel would help getting maximum quantity of finished product from a given raw material.

The procedure for control of scrap should start with establishing a standard of scrap with each department, job or process, taking into consideration the nature of material, the nature of the manufacturing operation, the use of proper equipment, the size of the material, the employment of proper personnel and defining areas of responsibility. It is also necessary to establish a scheme of scrap reporting. The actual scrap should be compared with the predetermined standard, and the reasons for the difference, if any, should be investigated, corrective action taken, whenever the actual scrap is found to be more than what is normally allowed. Also, it is to be ensured that proper supervision is exercised at the scrap generation stage.

Question 8

What is ABC analysis ? Discuss its role in a sound system of material control.

Answer

ABC analysis is a technique through which selective control can be exercised over the various items of inventory. These days the manufacturing units have such a large number of items in their stores that it is often not possible for the management to pay minute attention to each and every item. A system is therefore divised by which these items are classified according to their importance and then selective control exercised. ABC analysis or Selective Inventory Control is a technique whereby the measure of control over an item of inventory varies directly with its usage value. In other words, the high value items are controlled more closely than the items of low value.

To classify the various items according to their usage value, the following procedure is adopted:

(a) The quantity or the number of parts expected to be used for production in the given period is estimated.

(b) The quantity as estimated above is multiplied by the unit value of the item.

(c) All the items are then re-arranged according to their usage value in a descending order.

(d) It would normally be found that a small number of items add upto a very high value. Thus 5 to 10 percent of total items may constitute 70 to 85 percent of material cost. Such items are classified as A items. Another 10 to 20 percent of total items may represent 10 to 20 percent of the total material cost. These items may be categorised as B items. The rest, i.e. 70 to 85-percent of items, though numerous, will thus form only 5 to 10 percent of total material cost. These may be called C items.

This classification thus highlights the more significant items. Management can then exercise a very close control over A items. It may apply occasional control over B items. As regards C items, it may exercise control only in a general manner. For example, it may order the quantities of C items annually or once in six months or so. It is obvious that since C items do not have a high value, the total investment in such items will not be large.

Regarding A items, the management will have to define the stock levels, i.e., maximum, minimum, reordering and danger very carefully. Also a close check on the consumption of these items will have to be kept. The economic order quantity for each of the items in this category should be worked out. Similarly other technique of inventory control should also be applied to A items. It would be appreciated that since A items constitute the bulk of the investment in the total inventory, it would be worthwhile to bring them under close control and to apply modern management inventory control techniques.

ABC analysis helps the management in the following ways:

(1) The investment in inventories is optimised through a close and direct control over A items. This would naturally release funds which can then be channelised into more profitable areas. This would raise the overall return on investment earned by the unit.

(2) The ordering and carrying costs are reduced since the management would attempt to optimise such costs so far as they relate to the bulk of the items.

(3) If the management seeks to exercise direct control over all the items of inventory, the inventory control system would become very expensive. ABC analysis therefore cuts down the cost of the system and relates its cost to the attendant benefits.

(4) The main objectives of inventory control are fulfilled under this system at the minimum cost. With scientific control of inventories, the stock turnover rate can be maintained at comparatively high levels.

The concept of ABC analysis can be used in areas other than inventory also. This technique basically emphasises that where the items to be controlled are numerous, one should categorise them according to their importance. Close control should then be exercised on the most significant category. On the less important categories, the degree of control maybe related to the benefit from control.

Thus finally it may be concluded that ABC analysis plays an important role for a sound system of material control.

Question 9

Distinguish between

(a) Perpetual Inventory System and continuous stock taking.

(b) Bill of materials and material requisition note

Answer

(a) Distinction between Perpetual Inventory System and Continuous Stock taking

Perpetual Inventory System: It is a system of stock control followed by the stores department. Under this system, a continuous record of receipt and issue of material is maintained by the stores department. In other words, in this system, stock control cards or bin cards and the stores ledger show clearly the receipts, issues and balance of all items in stock at all times. This system facilitates planning of production and ensures that production is not interrupted for want of materials and stores.

Continuous Stock taking: It means physical verification of stores items on a continuous basis to reveal the position of actual balances. Such a verification is conducted round the year, thus covering each item of store twice or thrice. Any discrepancies, irregularities or shortages brought to the notice, as a result of continuous stock verification are reported to the appropriate authorities for initiating necessary rectification measures. This system works as a moral check as stores staff and acts as a deterrent to dishonesty.

A perpetual inventory system is usually supported by a programme of continuous stock taking. That is continuous stock taking is complementary to the perpetual inventory system. Sometimes the two terms are considered synonymous but it is not so. The success of the perpetual inventory system depends upon the maintenance and upto date writing up of (i) the stores ledger and (ii) bincards/stock control cards, Continuous stock taking, ensures the veracity of figures shown by the above records

(b) Distinction between bill of materials and material requisition note.

Bill of materials: It is a list of material: required either for a particular job or for a work order. It contains the description; code and quantity of materials and other stores items required for a particular job or work order. It serves as an advance intimation to stores department about the requirement of materials. It acts as an authorisation for the issue of all materials and stores items mentioned in the bill of materials. Its use reduces paper work and ensures requisition of the exact quantity of materials to the user department.

Material requisition note: It is a formal request, for the supply of specified materials, stores etc., to the production department for a specific job or work order. It authorises the issuing department to draw from stores the requisitioned materials. Such a note contains information about the description, code and quantity of materials needed. It also has job/work order number for which the material has been requisitioned. This note is signed by the Foreman of the concerned department.

Question 10

Distinguish amongst:

Waste

Spoilage

Salvage

Rectification

Scrap.

How are they treated in Cost Accounts.

Answer

Waste : It represents the portion of basic raw materials lost in processing having no recoverable value. Waste may be visible-remnants of basic raw materials—or invisible, e.g., disappearance of basic raw materials through evaporation, smoke etc.

Normal waste is absorbed in the cost of net output, whereas abnormal waste is transferred to the Costing Profit and Loss Account.

For effective control of waste, normal allowances for yield and waste should be made from past experience, technical factors and special features of the material process and product. Actual yield and waste should be compared with anticipated figures and appropriate actions should be taken where necessary. Responsibility should be fixed on purchasing, storage, maintenance, production and inspection staff to maintain standards. A systematic procedure for feedback of achievement against laid down standards should be established.

Spoilage : It is the term used for materials which are badly damaged in manufacturing operations, and they cannot be rectified economically and hence taken out of process to be disposed of in some manner without further processing. Spoilage maybe either normal or abnormal.

Normal spoilage (i.e., which is inherent in the operation) costs are included in costs either by charging the loss due to spoilage to the production order or charging it to production overhead so that it is spread over all products. Any value realised from spoilage is credited to production order or production overhead account, as the case may be.

The cost of abnormal spoilage (i.e., arising out of causes not inherent in manufacturing process) are charged to the Costing Profit and Loss Account. When spoiled work is the result of rigid specification, the cost of spoiled work is absorbed by good production while the cost of disposal is charged to production overead.

To control spoilage, allowance for normal spoilage should be fixed and actual spoilage should be compared with standard set. A systematic procedure of reporting would help control over spoilage. A spoilage report should highlight the normal and abnormal spoilage, the department responsible, the causes of spoilage and the corrective action taken, if any.

Salvage: Salvaged material refers to the material retrieved from the spoiled work. Salvage is the process by which salvaged material is retrieved. The salvaged units of material are usable in the production.

The value of salvaged material may be credited to the account to which spoilage is charged.

Rectification: It means bringing back the defective units either to standard units of production or as seconds, by reworking. The work of rectification in small concern's is usually entrusted to the production shop, whereas in big concerns, a separate department carries out the task. Before the start of rectification work an estimate of the cost of rectification is prepared and compared with the excess value to be obtained after rectification. The concern only goes ahead with the task of rectification if the aforesaid comparison is found favourable.

The task of rectification is usually carried out under a 'Rectification Work Order', and all costs of re-work are collected against this work order for material, labour and overhead.

If the defective production is inherent in the process of manufacture, and arises as a normal consequence of productive activities and if it can be identified with specific jobs, the rectification cost is charged to the jobs as the cost of manufacturing good units of the product. This will have the effect of adding to the cost of the jobs. If the expenditure on rectification is considered abnormal, it is excluded from product costs and charged to Costing Profit and Loss Account.

Scrap: It has been defined as the incidental residue from certain types of manufacture, usually of small amount and low value, recoverable without further processing. Scrap may be treated to cost accounts in the following ways:

(i) Where the value of scrap is negligible, it may be excluded from costs. In other words, the cost of scrap is borne by good units and income from scrap is treated as other income.

(ii) The sales value of scrap, net of selling and distribution cost, is deducted from over-head to reduce the overhead rate. A variation of this method is to deduct the net realisable value from material cost. This method is followed when scraps cannot be segregated job or process-wise.

(iii) When scrap is identifiable with a particular job or process and its value is significant, the scrap account should be charged with full cost. The credit is given to the job or process concerned. The profit or loss in the scrap account, on realisation, will be transferred to the Costing Profit and Loss Account.

Control of scrap really means the maximum effective utilisation of raw material. Scrap control does not, therefore, start in the production department, it starts from the stage of product designing. Thus the most suitable type of materials, the right type of equipment and personnel would help in getting maximum quantity of finished product from a given raw material.

A standard allowance for scrap should be fixed and actual scrap should be collected, recorded and reported, indicating the cost centre responsible for it. A periodical scrap report

would serve the purpose where two or more departments or cost centres are responsible for the scrap; the reports should be routed through the departments concerned.

Question 11

Draw a proforma of "Bill of Materials". List down the Advantages of using the same.

Answer

Proforma of

Bill of Materials

Job No. _____ No. _____

Department authorised _____ Date _____

S.No.	*Code No. or size*	*Description*	*Qty.*	*Date of Issue and Qty. issued*		*Rate Rs.*	*Amount Rs.*
				Date	*Qty.*		

Received by_____

Authorised by _____ Checked by _____

Store Keeper's Signature _____ Cost Clerk

Advantages of the using Bill of Materials

A bill of materials serves the purpose of an advance intimation to the concerned department of the orders to be executed. It is usually prepared in quadruples. A copy of it is usually sent to each of the following department.

(i) Stores department

(ii) Cost Accounts department

(iii) Production Control department

The advantages of using "Bill of materials" by the above departments may be summed up as follows:

Stores department

(1) A Bill of materials serves as an important basis of preparing material purchase requisitions by stores department.

(2) It acts as an authorisation for issuing total material requirement.

(3) The clerical activity is reduced as the stores clerk issues the entire/part of the material requirement to the users, if the details of material asked are present in the Bill of materials.

Cost Accounts department

(1) "Bill of materials" is used by Cost accounts department for preparing an estimate / budget of material cost for the job/process / operation, it is meant.

(2) It may be used as a device for controlling the excess cost of material used. This is done after determining material variances and ascertaining the reasons for their occurrence.

Production Control Department

(1) "Bill of materials" may be used by this department for controlling usage of materials.

(2) Its usage saves time which otherwise would have been wasted for preparing separate requisitions of material.

Question 12

Write notes on Bill of Material *(May, 1998, 4 marks)*

Answer

Bill of material

In most of the manufacturing units a list of materials required for a particular work or job order is prepared. Such a list is usually prepared either by the engineering or production planning department. This list is known as a bill of material.

Bill of materials has code; description and quantity of materials and other stores items required for carrying out a particular work or job order. It also acts as an authorisation for the issue of materials and stores items mentioned in it. Use of Bill of materials saves paper work and also ensures requisition of the exact quantity of materials. It also saves the botheration of stores people of preparing and issuing a number of material requisition slips It also acts as an advance intimation to stores and purchase department about the requirements of materials.

Generally four copies of it are prepared, one for each of the following departments.

(a) Stores department

(b) Production department

(c) Cost Accounts department

(d) Production planning department.

Question 13

How are normal and abnormal loss of material arising during storage treated in Cost Accounts? *(May, 2001, 5 marks)*

Answer

Cost Accounts treatment of normal and abnormal loss of material arising during storage.

The difference between the book balance and actual physical stock, which may either be gain or loss, should be transferred to Inventory Adjustment Account pending scrutiny to ascertain the reason for the difference.

If on scrutiny, the difference arrived at is considered as normal, then such a difference should be transferred to overhead control account and if abnormal, it should be debited to costing profit and loss account.

In the case of normal losses, an alternative method may be used. Under this method the price of the material issued to production may be inflated so as to cover the normal loss.

Question 14

Distinguish clearly Bincards and Sores Ledger *(May, 1999, 4 marks)*

Answer

Both bin cards and stores ledger are perpetual inventory records. None of them is a substitute for the other. These two records may be distinguished from the following points of view:

(i) Bin card is maintained by the store keeper, while the stores ledger is maintained by the cost accounting department.

(ii) Bin card is the stores recording document whereas the stores ledger is an accounting record.

(iii) Bin card contains information with regard to quantities i.e. their receipt, issue and balance while the stores ledger contains both quantitative and value information in respect of their receipts, issue and balance.

(iv) In the bin card entries are made at the time when transaction takes place. But in the stores ledger entries are made only after the transaction has taken place.

(v) Inter departmental transfer of materials appear only in stores ledger.

(vi) Bin cards record each transaction but stores ledger records the same information in a summarized form.

Question 15

What is Just in Time (JIT) purchases? What are the advantages of such purchases?

(May,1999, 3 marks)

Answer

Just in time (JIT) purchases means the purchase of goods or materials such that delivery immediately precedes their use.

Advantages of JIT purchases:

Main advantages of JIT purchases are as follows:

1. The suppliers of goods or materials cooperates with the company and supply requisite quantity of goods or materials for which order is placed before the start of production.
2. JIT purchases results in cost savings for example, the costs of stock out, inventory carrying, materials handling and breakage are reduced.
3. Due to frequent purchases of raw materials, its issue price is likely to be very close to the replacement price. Consequently the method of pricing to be followed for valuing material issues becomes less important for companies using JIT purchasing.
4. JIT purchasing are now attempting to extend daily deliveries to as many areas as possible so that the goods spend less time in warehouses or on store shelves before they are exhausted.

Question 16

Distinguish between perpetual inventory and continuous stock trading.

(November, 1996, 4 marks)

Answer

Perpetual Inventory and Continuous Stock Taking:

Perpetual Inventory is a system in which a continuous record of receipt and issue of materials is maintained by the stores department. In this system the stock control cards, bin cards and stores ledger show the receipts, issue and balance of each item at any point of times after each transaction. The stocks as per dual records namely bin card and stores ledger are reconciled on a continuous basis. The system facilitates planning and control.

Continuous Stock taking is a system of physical verification of stocks of each item on continuous basis. The actual quantity in the bincard is compared with bin balances. Such a verification is conducted round the year such that all items of stocks are verified 3 to 4 times in a year. Any discrepancies are investigated and reported for corrective action. It also serves as a moral check on stores staff and acts as deterrent to dishonesty.

A Perpetual Inventory System is usually supported by Continuous Stock taking. It calls for upto date .writing up of stores/ledger and bin cards and stock control-cards. The balances as per bin card and stores ledger are compared when every receipt or issue is posted. The physical balance on continuous stock taking is also compared with the bincard or ledger balances. Thus-monthly accounts can be prepared with confidence.

Question 17

Discuss the accounting treatment of defectives in cost accounts (May, 2000, 4 marks)

Answer

Accounting treatment of defectives in cost accounts:

Defectives refers to those units or portions of production, which do not meet the prescribed specifications. Such units can be reworked or re-conditioned by the use of additional material, labour and /or processing and brought to the point of either standard or sub-standard units.

The possible way of treating defectives in cost accounts are as below:

1. When defectives are normal and it is not beneficial to identity them job-wise, then the following methods may be used.
   (a) *Charged to good products:* The cost of rectification of normal defectives is charged to good units. This method is used when defectives rectified are normal.
   (b) *Charged to general overheads.* If the department responsible for defectives cannot be identified, the rework costs are charged to general overheads.
   (c) *Charged to departmental overheads:* If the department responsible for defectives can be correctly identified, the rectification costs should be charged to that department.
2. When normal defectives are easily identifiable with specific job the rework costs are debited to the identified job.
3. When defectives are abnormal and are due to causes within the control of the organisation, the rework cost should be charged to the Costing Profit and Loss Account.

Question 18

Discuss the concept of Economic Batch Quantity (EBQ) (May, 2000, 2 marks)

Answer

Economic batch quantity: Production is usually done in batches and each batch can have any number of units of a component in it. The optimum quantity for a batch is that quantity for which the setting up and carrying costs are minimum. Such an optimum quantity is known as "Economic batch quantity". The formula used to determine the economic batch quantity (EBQ) is:

$$EBQ = \sqrt{\frac{2DS}{C}}$$

where, EBQ = Economic batch quantity

D = Demand of the components in a year

S = Setting up cost per batch

C = Carrying cost p.u. per annum

Question 19

Explain the concept of "ABC Analysis" as a technique of inventory control

(May, 2000, 3 marks)

Answer

ABC Analysis: It is a system of selective inventory control whereby the measure of control over an item of inventory varies with its usage value. It exercises discriminatory control over different items of stores grouped on the basis of the investment involved,. Usually the items of material are grouped into three categories viz; A, B and C according to their use value during a period. In other words, the high use value items are controlled more closely than the items of low use value.

(i) 'A' Category of items consists of only a small percentage i.e., about 10 % of the total items of material handled by the stores but require heavy investment i.e., about 70% of inventory value, because of their high prices and heavy requirement.

(ii) 'B' Category of items comprises of about 20% of the total items of material handled by stores. The percentage of investment required is about 20% of the total investment in inventories.

(iii) 'C category of items does not require much investment. It may be about 10% of total inventory value but they are nearly 70% of the total items handled by stores.

'A' category of items can be controlled effectively by using a regular system, which ensures neither over- stocking nor shortage of materials for production. Such a system plans its total material requirements by making budgets. The stocks of materials are controlled by fixing certain levels like maximum level, minimum level and re-order level. A reduction in inventory management costs is achieved by determining economic order quantities after taking into account ordering cost and carrying cost. To avoid shortages and to minimize heavy investment of funds in inventories, the techniques of value analysis, variety reduction, standardization etc. are used along with aforesaid techniques.

In the case of 'B' category of items, as the sum involved is moderate, therefore, the same degree of control as applied in 'A' category of items is not warranted. The order for the items, belonging to this category may be placed after reviewing their situation periodically. This category of items can be controlled by routine control measures.

For 'C' category of items, there is no need of exercising constant control. Orders for items in this group may be placed either after six months or once in a year, after ascertaining consumption requirements.

Question 20

Distinguish between Re-order level and Re-order quantity

Answer

Re-order level & Re-order quantity: Re-order level is defined as that level of an inventory item where a fresh order for its replenishment is placed. Mathematically it can be determined by using the following formulas:

Re-order level (ROL) = [Maximum consumption x Maximum re-order period]

Alternatively: $= \text{Minimum level} + \left(\begin{matrix}\text{Average rate of} \\ \text{consumption}\end{matrix} \times \begin{matrix}\text{Average} \\ \text{re}-\text{order period}\end{matrix}\right)$

Re-order quantity (ROQ) is defined as that quantity of an inventory item for which order is placed again and again. Economic order quantity is a re-order quantity but not vice-a-versa. It can be determined by using the following mathematical expression:

$$\text{EOQ} = \text{ROQ} = \sqrt{\frac{2 \times \text{Annual requirement of inventory item in units} \times \text{Ordering cost per order}}{\text{Annual carrying cost per unit per annum}}}$$

Question 21

Describe perpetual inventory records and continuous stock verification. (May, 2001, 3 marks)

Answer

Perpetual inventory records and continuous stock verification:

Perpetual inventory records represents a system of records maintained by the stores department. It in fact comprises of (i) Bin cards, and (ii) Stores Ledger.

Bin cards maintains a quantitative record of receipts, issues and closing balances of each item of stores. Separate bin cards are maintained for each item. Each card is filled up with the physical movement of goods i.e. on its receipt and issue.

Like bin cards the stores ledger is maintained to record all receipts and issues in respect of materials. Entries in it are made with the help of goods received notes and material issue requisitions.

A perpetual inventory record is usually checked by a programme of continuous stock verification. Continuous stock verification means the physical checking of those inventory records (which are maintained under perpetual inventory) with actual stock.

Perpetual inventory records helps in proper material control as discrepancies in physical stock and book figures are regularly reconciled through continuous stock verification.

Question 22

"To be able to calculate a basic EOQ certain assumptions are necessary. "List down these assumptions . (November, 1995, 2 marks)

Answer

The computation of economic order quantity is subject to the following assumptions:

(i) Ordering cost (per order) and carrying cost (per unit/annum) are known and constant.

(ii) Anticipated usage (in units) of material for a period is uniform and known.

(iii) Cost per unit of the material (to be purchased) is known and it is constant.

Question 23

Draw specimen draft of a 'Purchase Order'. *(May, 1997, 4 marks)*

Answer

(a) **Specimen draft of a 'Purchase Order'**

ABC Limited

_____

Purchase Order

No. _____

Dated:_____

To

_____

_____

_____

Dear Sirs,

With reference to your quotation No. ____ dated _____, has been accepted by our office. Please supply the following item of stores on the terms and conditions listed on the reverse of this order; latest by _____

S.No.	Description	Quantity	Rate Rs.	Amount Rs.

Terms of delivery: _____

Terms of Payment : _____

Packing and dispatch instructions: _____

Bill to be sent to:

Yours faithfully,

Purchase Officer

Question 24

How is slow moving and non-moving item of stores detected and what steps are necessary to reduce such stocks? (November, 2001, 4 marks)

Answer

Detection of slow moving and non-moving item of stores:

The existence of slow moving and non-moving item of stores can be detected in the following ways.

(i) By preparing and scanning periodic reports showing the status of different items or stores.

(ii) By calculating the stock holding of various items in terms of number of days/ months of consumption.

(iii) By computing ratios periodically, relating to the issues as a percentage of average stock held.

(iv) By implementing the use of a well designed information system.

Necessary steps to reduce stock of slow moving and non-moving item of stores:

(i) Proper procedure and guidelines should be laid down for the disposal of non-moving items, before they further deteriorates in value.

(ii) Diversify production to use up such materials.

(iii) Use these materials as substitute, in place of other materials.

Question 25

Distinguish between Bin Card and Stores Ledger. (May, 2002, 2 marks)

Answer

Bin Card	*Stores Ledger*
Bincards are maintained in the stores and are serving the purpose of stock register.	Stores ledger is maintained in the cost accounts department.
Entries in it are posted by the issue clerk. He records the quantity about receipts, issues and closing balance along with code number of material, maximum, minimum and reorder levels.	Here entries are posted by the stores ledger clerk. He records the quantities and value about receipts, issues and closing balance along with code number of material, maximum, minimum and reorder levels.
Here transactions are posted individually.	Here transactions can be posted periodically.
Posting is done at the time of issue of material.	Posting . is done after the issue of materials.

Question 26

Explain the advantages that would accrue in

Using the LIFO method of pricing for the valuation of raw material stock

Answer

(a) *LIFO- Last-in-first-out:* A method of pricing for the valuation of raw material stock. It is based on the assumption that the items of the last batch(lot) purchased are the first to be issued. Therefore, under this method, the price of the last batch(lot) of raw material is used for pricing raw material issues until it is exhausted. If, however, the quantity of raw material issued is more than the quantity of the latest lot, the price of the last but one lot and so on will be taken for pricing the raw material issues.

The advantages that would accrue from the use of LIFO method of pricing the valuation of raw materials, are as follows:-

(i) The cost of materials used is nearer to the current market price. Thus the cost of goods produced depends upon the trend of the market price of materials. This enables the matching of cost of production with current sales revenues.

(ii) Use of LIFO during the period of rising prices does not depict unnecessarily high profit in the income statement; compared to the first-in-first-out or average methods. The profit shown by the use of LIFO is relatively lower, because the cost of production takes into account the rising trend of material prices.

(iii) When price of materials fall, the use of LIFO method accounts for rising the profits due to lower material cost. Inspite of this finished product appears to be more competitive and at market prices.

(iv) Over a period, the use of LIFO will iron out the fluctuations in profit.

(v) During inflationary period, the use of LIFO will show the correct profit and thus avoid paying unduly high taxes to some extent.

Question 27

What is a purchase requisition? Give a specimen form of a purchase requisition.

(November, 1998, 4 marks)

Answer

A Purchase requisition is a form used for making a formal request to the purchasing department to purchase materials. Purchase requisitions are usually initiated by

(i) A store department for regular and standard items held in the stock.

(ii) The production control department for special material required for specific jobs.

(iii) The maintenance department for maintenance equipment and items of capital expenditure.

(iv) The heads of departments for office equipments.

The aforesaid arrangement is only a matter of convenience. In some concerns distinction is made between regular indents and special indents, depending upon whether the items are needed for replacing stocks or for special orders. But both types of indents are initiated by the stores department. Irrespective of the differences regarding the procedure for initiating purchase requisition, the purchase manager should have with him a list of the persons authorised to requisition materials.

Each purchase requisition should clearly state the quantity, quality and other specifications in the appropriate column of the given specimen form along with the purpose for which materials are required. It should also indicate the date by which such materials are needed.

Depending upon the procedure to be followed appropriate number of copies of the purchase requisitions may be prepared and used accordingly. A specimen form of purchase requisition is given below:-

A specimen form of purchase requisition

Date _____ For Stock Date of requirement _____

Req. No._____ Dept. or work order No._____

Sl. No.	Code No.	Description	Quantity	Grade	Remarks

Requisitioned by _____ Checked by _____ Approved by _____

For Purchase Department use

Purchase Order No. _____ Date of Purchase _____

Name of supplier _____ Expected date of delivery _____

Question 28

What do you understand by ABC analysis of inventory control ? A factory uses 4,000 varieties of inventory. In terms of inventory holding and inventory usage, the following information is compiled:

No. of varieties of inventory	*%*	*% value of inventory holding (average)*	*% of inventory usage (in end-product)*
3,875	*96.875*	*20*	*5*
110	*2.750*	*30*	*10*
15	*0.375*	*50*	*85*
4,000	*100.000*	*100*	*100*

Classify the items of inventory as per ABC analysis with reasons. (November, 1998, 6 marks)

Answer

ABC Analysis: It is a system of selective inventory control whereby the measure of control over an item of inventory varies with its usage value. It exercises discriminatory control over different items of stores grouped on the basis of the investment involved. Usually the items of material are grouped into three categories viz; A, B and C according to their use value during a period. In other words, the high use value items are controlled more closely than the items of low use value.

(i) 'A' Category of items consists of only a small percentage i.e., about 10% of the total items of material handled by the stores but require heavy investment i.e., about 70% of inventory value, because of their high prices and heavy requirement.

(ii) 'B' Category of items comprises of about 20% of the total items of material handled. by stores. The percentage of investment required is about 20% of the total investment in inventories.

(iii) 'C' category of items do not require much investment. It may be about 10% of total inventory value but they are nearly 70% of the total items handled by stores.

'A' category of items can be controlled effectively by using a regular system which ensures neither over-stocking nor shortage of materials for production: Such a system plans its total material requirements by making budgets. The stocks of materials are controlled by fixing certain levels like maximum level, minimum level and re-order level. A reduction in inventory management costs is achieved by determining economic order quantities after taking into account ordering cost and carrying cost. To avoid shortages and to minimize heavy investment of funds in inventories, the techniques of value analysis, variety reduction, standardisation etc. are used along with aforesaid techniques.

In the case of 'B' category of items, as the sum involved is moderate, therefore the same degree of control as applied in 'A' category of items is not warranted. The orders for the items, belonging to this category may be placed after reviewing their situation periodically. This category of items can be controlled by routine control measures.

For 'C' category of items, there is no need of exercising constant control. Orders for items in this group, may be placed either after six months 0r once in a year, after ascertaining consumption requirements.

Classification of the items of inventory as per ABC analysis

1. 15 number of varieties of inventory items, should be classified as 'A' category items because of the following reasons:
   (i) Constitute 0.375% of total number of varieties of inventory items handled by stores of factory, which is minimum as per given classification in the table.
   (ii) 50% of total use value of inventory holding (average) which is maximum according to the given table.
   (iii) Highest consumption of about 85% of inventory usage (in end-product).
2. 110 number of varieties of inventory items, should be classified as 'B' category items because of the following reasons:

(i) Constitute 2.750% of total number of varieties of inventory items handled by stores of factory.
(ii) Requires moderate investment of about 30% of total use value of inventory holding (average).
(iii) Moderate consumption of about 10% of inventory usage (in end- product).

3. 3,875 number of varieties of inventory items, should be classified as 'C' category items because of the following reasons:
(i) Constitute 96.875% of total varieties of inventory items handled by stores of factory.
(ii) Requires investment of 20% of total use value of inventory holding (average).
(iii) Minimum consumption i.e. about 5% of inventory usage (in end-product).

Question 29

The following information is extracted from the Stores Ledger:–

Material X

Opening Stock	*Nil*
Purchases :	
Jan.1	*100 @ Re. 1 per unit*
Jan. 20	*100 @ Rs. 2 per unit*
Issues:	
Jan. 22	*60 for Job W 16*
Jan 23	*60 for Job W 17*

Complete the receipts and issues valuation by adopting the First-in First-Out, Last-in First Out and the Weighted Average Method. Tabulate the values allocated to Job W 16, Job W 17 and the closing stock under the methods aforesaid and discuss from the different points of view which method you would prefer.

Answer

See next pages for Statements.

From the point of view of cost of material charged to each job, it is minimum under FIFO and maximum under LIFO. During the period of rising prices, the use of FIFO gives rise to high profits and that of LIFO low profits. In the case of weighted average there is no significant adverse or favourable effect on the cost of material as well as on profits.

From the point of view of valuation of closing stock it is apparent from the above statement that it is maximum under FIFO, moderate under weighted average and minimum under LIFO.

It is clear from the above that the use of weighted average evens out the fluctuations in the prices. Under this method, the cost of materials issued to the jobs and the cost of material in hand reflects greater uniformity than under FIFO and LIFO. Thus from different points of view, weighted average method is preferred over LIFO and FIFO.

Answer

Statement of Receipts and Issues by adopting First-in-First-Out Method

Date	Particulars	Receipts			Issues			Balance		
		Units No.	Rate Rs.	Value Rs.	Units No.	Rate Rs.	Value Rs.	Units No.	Rate Rs.	Value Rs.
Jan 1	Purchase	100	1	100	–	–	–	100	1	100
Jan 20	Purchase	100	2	200	–	–	–	100	1	100
								100	2	200
Jan. 22	Issue to	–	–	–	60	1	60	40	1	40
	Job W 16							100	2	200
Jan. 23	Issue to	–	–	–	40	1	40			
	Job W 17				20	2	40	80	2	160

Statement of Receipts and Issues by adopting Last-In-First-Out method

Date	Particulars	Receipts			Issues			Balance		
		Units No.	Rate Rs.	Value Rs.	Units No.	Rate Rs.	Value Rs.	Units No.	Rate Rs.	Value Rs.
Jan 1	Purchase	100	1	100	–	–	–	100	1	100
Jan 20	Purchase	100	2	200	–	–	–	100	1	100
								100	2	200
Jan. 22	Issue to	–	–	–	60	2	120	100	1	100
	Job W 16							40	2	80
Jan. 23	Issue to	–	–	–	40	2	80	80	1	80
	Job W 17				20	1	20			

Statement of Receipt and Issues by adopting Weighted Average method

Date	*Particulars*	*Receipts*			*Issues*			*Balance*		
		Units No.	*Rate Rs.*	*Value Rs.*	*Units No.*	*Rate Rs.*	*Value Rs.*	*Units No.*	*Rate Rs.*	*Value Rs.*
Jan 1	Purchase	100	1	100	—	—	—	100	1	100
Jan 20	Purchase	100	2	200	—	—	—	200	1.50	300
Jan. 22	Issue to Job W 16	—	—	—	60	1.50	90	140	1.50	210
Jan. 23	Issue to Job W 17	—	—	—	60	1.50	90	80	1.50	120

Statement of Material values allocated to Job W 16, Job W 17 and Closing Stock, under aforesaid methods

	FIFO	*LIFO*	*Weighted Average*
	Rs.	*Rs.*	*Rs.*
Material for Job W 16	60	120	90
Material for Job W 17	80	100	90
Closing Stock	160	80	120
	300	300	300

Question 30

AT Ltd. furnishes the following stores transactions for September, 1982

1-9-82	*Opening balance*	*25 Units value Rs. 162.50*
4-9-82	*Issues Req. No. 85*	*8 Units*
6-9-82	*Receipts from B & Co. GRN NO. 26*	*50 Units @ Rs. 5.75 per unit*
7-9-82	*Issues Req. No. 97*	*12 Units*
10-9-82	*Returns to B & Co.*	*10 Units*
12-9-82	*Issues Req. No. 108*	*15 Units*
13-9-82	*Issues Req. No.110*	*20 Units*
15-9-82	*Receipts from M & Co. GRN NO. 33*	*25 Units @ Rs. 6.10 per unit*
17-9-82	*Issues Reg. No. 121*	*10 Units*
19-9-82	*Received replacement from B & Co. GRN No. 38*	*10 Units*
20-9-82	*Returned from department material of M & Co. MRR No.4*	*5 Units*
22-9-82	*Transfer from Job 182 to Job 187 in the dept. MTR 6*	*5 Units*
26-9-92	*Issues Req. No. 146*	*10 units*
29-9-82	*Transfer from Dept. "A" to Dept. "B" MTR 10*	*5 Units*
30-9-82	*Shortage in stock taking*	*2 Units*

Write up the priced stores ledger on FIFO method and discuss how would you treat the shortage in stock taking.

Answer

Stores Ledger of AT Ltd. for the month of September, 1982 (FIFO method)

Date	Receipt				Issue				Balance		
	GRN No. MRR No.	Qty. Units	Rate Rs. P.	Amount Rs. P.	Requisition No.	Qty. Units	Rate Rs. P.	Amount Rs. P.	Qty. Units	Rate Rs. P.	Amount Rs. P.
1	2	3	4	5	6	7	8	9	10	11	12
1.9.82	–	–	–	–	–	–	–	–	25	6.50	162.50
4.9..82	–	–	–	–	85	8	6.50	52	17	6.50	110.50
6.9.82	26	50	5.75	287.50	–	–	–	–	17	6.50	
									50	5.75	398.00
7.9.82	–	–	–	–	97	12	6.50	78	5	6.50	
									50	5.75	320.00
10.9.82	–	–	–	–	Nil	10	5.75	57.50	5	6.50	
									40	5.75	262.00
12.9.82	–	–	–	–	108	5	6.50				
						10	5.75	90	30	5.75	172.50

1	2	3	4	5	6	7	8	9	10	11	12
13.9.82	–	–	–	–	110	20	5.75	115	10	5.75	57.50
15.9.82	33	25	6.10	152.50	–	–	–	–	10	5.75	
									25	6.10	210.00
17.9.82	–	–	–	–	121	10	5.75	57.50	25	6.10	152.50
19.9.82	38	10	5.75	57.50	–	–	–	–	25	6.10	
									10	5.75	210.00
20.9.82	4	5	5.75	28.75	–	–	–	–	5	5.75	
									25	6.10	
									10	5.75	238.75
26.9.82	–	–	–	–	146	5	5.75		20	6.10	
						5	6.10	59.29	10	5.75	179.50
30.9.82	–	–	–	–	Shortage	2	6.10	12.20	18	6.10	
									10	5.75	167.30

Working Notes

1. The material received as replacement from vendor is treated as fresh supply.
2. In the absence of information the price of the material received from within on 20.9.82 has been taken as the price of the earlier issue made on 17.9.82. In FIFO method physical flow of the material is irrelevant for pricing the issues.
3. The issue of material on 26.9.82 is made out of the material received from within.
4. The entries for transfer of material from one job and department to other on 22.9.82 and 29.9.82 are book entries for adjusting the cost of respective jobs and as such they have not been shown in the stores ledger account.
5. The material found short as a result of stock taking has been written off.

Treatment of shortages in stock taking:

At the time of stock taking generally discrepancies are found between physical stock shown in the bin card and stores ledger. These discrepancies are in the form of shortages or losses. The ; causes for these discrepancies may be classified as unavoidable or avoidable.

Losses arising from unavoidable causes should be taken care of by setting up a standard percentage of loss based on the study of the past data. The issue prices may be inflated to cover the standard loss percentage. Alternatively, issues may be made at the purchase price but the cost of the loss or shortage may be treated as overheads.

Actual losses should be compared with the standard and excess losses should be analysed to see whether they are due to normal or abnormal reasons. If they are attributable to normal causes, an additional charge to overheads should be made on the basis of the value of materials consumed. If they arise from abnormal causes, they should be charged to the Costing Profit and Loss Account.

Avoidable losses are generally treated as abnormal losses. These losses should be debited to the Costing Profit and Loss Account.

Losses or surpluses arising from errors in documentation, posting etc. should be corrected through adjustment entries.

Question 31

A manufacturer of Surat purchased three Chemicals A, B and C from Bombay. The invoice gave the following information:

		Rs.
Chemical A :	*3,000 kg @ Rs. 4.20 per kg.*	*12,600*
Chemical B:	*5,000 kg @ Rs. 3.80 per kg.*	*19,000*
Chemical C:	*2,000 kg. @ Rs. 4.75 per kg.*	*9,500*
Sales Tax		*2,055*
Railway Freight		*1,000*
Total Cost		*44,155*

A shortage of 200 kg in Chemical A, of 280 kg. in Chemical B and of 100 kg. in Chemical C was noticed due to breakages. At Surat, the manufacturer paid Octroi duty @ Re 0.10 per kg. He also paid Cartage Rs. 22 for Chemical A, Rs. 63.12 for Chemical B and Rs. 31.80 for Chemical C. Calculate the stock rate that you would suggest for pricing issue of chemicals assuming a provision of 5% towards further deterioration.

Answer

Statement showing the Issue Rate of Chemicals

	Chemicals		
	A	*B*	*C*
	Rs.	*Rs.*	*Rs.*
Purchase Price	12,600	19,000	9,500
Add: Sales Tax @ 5% of purchase price *(Refer to Working Note 2)*	630	950	475
Add: Railway Freight in the ratio of 3:5:2 *(Refer to Working Note 3)*	300	500	200
Add: Octroi @ Re. 1.10 p.per kg. On the quantity of material received *(Refer to Working Note 1)*	280	472	190
Add: Cartage	22	6312	31.80
Total Price	13,832	20,985.12	10,396.80

$$\text{Rate of issue per Kg} = \frac{\text{Total price}}{\text{Qty. available for issue}} = \frac{\text{Rs.13,832}}{\text{2,660 kg.}} \quad \frac{\text{Rs.20,985.12}}{\text{4,484 Kg.}} \quad \frac{\text{Rs.10,396.80}}{\text{1,805 kg.}}$$

(Refer to Working Note 1) = Rs.5.20 = Rs. 4.68 = Rs. 5.76

Working Notes:

1. *Statement showing the quantity of chemicals available for issue*

	Chemicals		
	A	B	C
	Kg.	Kg.	Kg.
Quantity purchased	3,000	5,000	2,000
Less: Shortage (Assumed to be normal	200	280	100
Quantity received at the store	2,800	4,720	1,900
Less: Provision for further deterioration 5%	140	236	95
Quantity available for issue	2,660	4,484	1,805

2. *Rate of sales Tax* = $\frac{\text{Sales Tax}}{\text{Total Purchase price of Chemical}} \times 100 = \frac{\text{Rs.2,055}}{\text{Rs.41,100}} \times 100 = 5\%$

3. *Railway Freight:* It has been charged on the basis of quantity purchased i.e. A:3000 kg; B: 5000 kg; C: 2000 kg in the ratio of 3:5:2.

Question 32

Shriram Enterprises manufactures a special product "ZED". The following particulars were collected for the year 1986:

(a) *Monthly demand of ZED-1,000 units.*

(b) *Cost of placing an order Rs. 100.*

(c) *Annual carrying cost per unit Rs. 15.*

(d) *Normal usage 50 units per week*

(e) *Minimum usage 25 units per week.*

(f) *Maximum range 75 units per week*

(g) *Re-order period 4 to 6 weeks.*

Compute from the above

(1) Re-order Quantity

(2) Re-order level

(3) Minimum Level

(4) Maximum Level

(5). Average Stock Level

Answer

1. **Re-order Quantity of units used** = $\sqrt{\frac{2AS}{C}}$

(Refer to note)

Where A = Annual demand of input units

S = Cost of placing an order

C = Annual carrying cost per unit

$= \sqrt{\frac{2 \times 2600 \times \text{Rs.}100}{\text{Rs.}15}}$

= 186 units (approximately)

2. **Re-order Level** = Maximum re-order period × maximum usage
= 6 weeks × 75 units = 450 units

3. **Minimum Level** = Re-order Level – Normal usage × average re-order period)
= 450 units – 50 units × 5 weeks.
= 450 units – 250 units = 200 units

4. **Maximum Level** = Re-order level + Re order quantity – (Minimum usage × Minimum re-order period)
= 450 unit + 186 units – 25 units × 4 weeks
= 536 units

5. **Average Stock Level** = $\frac{1}{2}$ (Minimum Stock Level + Maximum Stock Level)
= $\frac{1}{2}$ (200 units + 536 units)
= 368 units

Note : A = Annual demand of input units for 12,000 units of "ZED"
= 52 weeks × Normal usage of input per week
= 52 weeks × 50 units of input per week
= 2,600 units

Question 33

(a) What is Economic Order Quantity?

(b) The Purchase Department of your organisation has received an offer of quantity discounts on its order of materials as under:

Price per tonne	*Tonnes*
Rs.	
1,400	*Less than 500*
1,380	*500 and less than 1,000*
1,360	*1,000 and less than 2,000*
1,340	*2,000 and less than 3,000*
1,320	*3,000 and above*

The annual requirement of the material is 5,000 tonnes. The delivery cost per order is Rs. 1,200 and the annual stock holding cost is estimated at 20 per cent of the average inventory.

The Purchase Department wants you to consider the following purchase options and advise which among them will be the most economical ordering quantity, presenting the relevant information in a tabular form.

The purchase quantity options to be considered are 400 tonnes, 500 tonnes, 1,000 tonnes, 2,000 tonnes and 3,000 tonnes

Answer

(a) Economic Order Quantity: Economic order quantity represents the size of the order for which both ordering and carrying costs together are minimum. If purchases are made in large quantities, inventory carrying cost will be high. If the order size is small, ordering cost will be high. Hence, it is necessary to determine the order quantity for which ordering and carrying costs are minimum. The formula used for determining economic order quantity is as follows:

$$EOQ = \sqrt{\frac{2AO}{C}}$$

Where:

A is the annual consumption of material in units

O is the cost of placing an order (ordering cost per order)

C is cost of interest and storing one unit of material for one year (carrying cost per unit per annum)

(b)

Total Annual Require-ment(s) (tonnes)	*Order size (Q) (tonnes)*	*Price per tonne*	*No. of orders S/Q*	*Cost of inventory S× price per tonne*	*Ordering Cost S/Q × Rs.1,200*	*Carrying Cost per tonne p.a $\frac{1}{2}$ ×Q×20% of price per tonne*	*Total cost*
		Rs.	*Rs.*	*Rs.*	*Rs.*	*Rs.*	*Rs.*
(1)	(2)	(3)	(4) =(1)/(2)	(5) =(1)×(3)	(6) =(4)×Rs.1,200	(7)	(8) =(5)+(6)+(7)
5000	400	1400	12.5	70,00,000	15,000	56,000	70,71,000
	500	1380	10	69,00,000	12,000	69,000	69,81,000
	1,000	1360	5	68,00,000	6,000	1,36,000	69,42,000
	2,000	1340	2.5	67,00000	3,000	2,68,000	69,71,000
	3,000	1320	1.67	66,00,000	2,000	3,96,000	69,98,000

Advice to Purchase Department: From the above table, it is clear that the most economical order size among the given options is 1,000 tonnes, as at this order size, the total cost is minimum.

Question 34

Component 'Pee' is made entirely in cost centre 100. Material cost is 6 paise per component and each component takes 10 minutes to produce. The machine operator is paid 72 paise per hour, and the machine hour rate is Rs. 1.50. The setting up of the machine to produce the component 'Pee' takes 2 hours 20 minutes.

On the basis of this information, prepare a cost sheet showing the production and setting up cost, both in total and per component, assuming that a batch of:

(a) 10 components,

(b) 100 components, and

(c) 1,000 components is produced

Answer

Cost Sheet of Component 'PEE'

Batch Size	*10*		*100*		*1000*	
	Total Rs.	*Per component Rs.*	*Total Rs.*	*Per Component Rs.*	*Total Rs.*	*Per Component Rs.*
Setting up Cost: (A)						
Machine Operators Wages *(2 hours 20 minutes @ 72 p.p.h.)*	1.68	0.168	1.68	0.0168	1.68	0.00168
Overheads *(2 hours 20 minutes @ Rs. 1.50 p.h.)*	3.50	0.350	3.50	0.035	3.50	0.0035
Production Cost : (B)						
Material Cost @ 6 p. per component	0.60	0.06	6.00	0.06	60.00	0.06
Machine Operators Wages *[Refer to Working Note (i)]*	1.20	0.12	12.00	0.12	120.00	0.12
Overheads *[Refer to Working Note (ii)]*	2.50	0.25	25.00	0.25	250.00	0.12
Total Cost (A + B):	9.48	0.948	48.18	0.4818	435.18	0.43518
Working Notes						
Components	10		100		1000	

(i) Operators Wages			
Time taken in minutes by machine Operators and machine @ 10 minutes per component	100	1000	10000
Operators Wages @ 72 p. per hour (Rs.)	1.20 $\left(\frac{100}{60} \times 0.72P\right)$	12.00 $\left(\frac{1000}{60} \times 0.72P\right)$	120.00 $\left(\frac{10000}{60} \times 0.72P\right)$
(ii) *Overhead expenses*			
Total overhead expenses in (Rs.) @ Rs. 1.50 per machine hour	2.50 $\left(\frac{100}{60} \times Rs.1.50\right)$	25.00 $\left(\frac{1000}{60} \times Rs.1.50\right)$	250.00 $\left(\frac{10000}{60} \times Rs.1.50\right)$

Question 35

X Ltd. is committed to supply 24,000 bearings per annum to Y Ltd. on a steady basis. It is estimated that it costs 10 paise as inventory holding cost per bearing per month and that the set-up cost per run of bearing manufacture is Rs. 324.

(a) What would be the optimum run size for bearing manufacture?

(b) Assuming that the company has a policy of manufacturing 6,000 bearing per run, how much extra costs the company would be incurring as compared to the optimum run suggested in (a) above?

(c) What is the minimum inventory holding cost?

Answer

(a) Optimum production run (O) = $\sqrt{\frac{2UP}{I}}$ where

U = No. of units to be produced within on year.

P = Set-up cost per production run.

I = Carrying cost per unit per annum.

= $\sqrt{\frac{2 \times 24{,}000 \times Rs.324}{0.10 \times 12}}$

= 3,600 bearings.

(b) Total Cost (of maintaining the inventories) when production run sizes (Q) are 3,600 and 6,000 bearing respectively.

Total Cost = Total set-up cost + Total carrying cost.

(Total set up cost) Q=3,600 = (No. of production runs ordered) × Set up cost per production run)

$$= \frac{24,000}{3,600} \times \text{Rs. } 324 = \text{Rs. } 2,160 \quad (1)$$

(Total set up cost) Q=6,000 $$= \frac{24,000}{6,000} \times \text{Rs. } 324 = \text{Rs. } 1,296 \quad (2)$$

(Total carrying cost) Q=3,600 $$= \frac{1}{2} Q \times I$$

$$= \frac{1}{2} \times 3,600 \times 0.10P \times \text{Rs. } 12 = \text{Rs. } 2,160 \quad (3)$$

(Total carrying cost) Q=6,000 $$= \frac{1}{2} \times 6,000 \times 0.10P \times \text{Rs. } 12 = \text{Rs. } 3,600 \quad (4)$$

(Total Cost) Q=3,600 = (1) + (3) = Rs. 2,160 + Rs. 2,160 = Rs. 4,320 (5)

(Total Cost) Q=6,000 = (2)+(4) = Rs. 1,296 + Rs. 3,600 = Rs. 4,896 (6)

Extra Cost incurred = (6) – (5) = Rs. 4,896 – Rs. 4,320 = Rs. 576

(c) Minimum inventory holding cost $= \frac{1}{2} Q \times I$

(When Q = 3,600 bearings)

$$= \frac{1}{2} \times 3,600 \times 0.10 P \times \text{Rs. } 12$$

= Rs. 2,160

Question 36

The following transactions in respect of material Y occurred during the six months ended 30th June, 1988

Month	*Purchase (Units)*	*Price per Unit Rs.*	*Issued units*
January	*200*	*25*	*Nil*
February	*300*	*24*	*250*
March	*425*	*26*	*300*
April	*475*	*23*	*550*
May	*500*	*25*	*800*
June	*600*	*20*	*400*

(a) The chief accountant argues that the values of closing stock remains the same no matter which method of pricing of material issues is used. Do you agree? Why or why not? Detailed stores ledgers are not required.

(b) When and why would you recommend the LIFO method of pricing material issues?

Answer

(a) The Closing Stock at the end of six months period i.e. on 30 June, 1988 will be 200 units, whereas upto the end of May 1988, total purchases coincide with the total issues i.e. 2,300 units. It means at the end of May 1988, there was no closing stock. In the month of June 1988, 600 units were purchased out of which 400 units were issued. Since there was only one purchase and one issue in the month of June 1988 and there was no opening stock on 1st June 1988, the Closing Stock of 200 units is to be valued at Rs. 20/- per unit.

In view of this, the argument of the Chief Accountant appears to be correct. Where there is only one purchase and one issue in a month with no opening stock, the method of pricing of material issues becomes irrelevant. Therefore, in the given case one should agree with the argument of the Chief Accountant that the value of Closing Stock remains the same no matter which method of pricing the issue is used.

It may, however, be noted that the argument of Chief Accountant would not stand if one finds the value of the Closing Stock at the end of each month.

(b) LIFO method has an edge over FIFO or any other method of pricing material issues due to the following advantages:

(i) The cost of the materials issued will be either nearer or will reflect the current market price. Thus, the cost of goods produced will be related to the trend of the market price of materials. Such a trend in price of materials enables the matching of cost of production with current sales revenues.

(ii) The use of the method during the period of rising prices does not reflect undue high profit in the income statement, as it was under the first-in-first out or average method. In fact, the profit shown here is relatively lower because the cost of production takes into account the rising trend of material prices.

(iii) In the case of falling prices, profit tends to rise due to lower material cost, yet the finished products appear to be more competitive and are at market price.

(iv) During the period of inflation, LIFO will tend to show the correct profit and thus, avoid paying undue taxes to some extent.

Question 37

The following information is provided by SUNRISE INDUSTRIES for the fortnight of April, 1988:–

Material Exe :

Stock on 1.4.1988 100 units at Rs. 5 per unit.

Purchases

5-4-88 300 units at Rs. 6

8-4-88 500 units at Rs. 7

12-4-88 600 units at Rs. 8

Issues

6-4-88 250 units

10-4-88 400 units

14-4-88 500 units

Required

(A) Calculate using FIFO and LIFO methods of pricing issues:

(a) the value of materials consumed during the period

(b) the value of stock of materials on 15-4-88.

(B) Explain why the figures in (a) and (b) in part A of this question are different under the two methods of pricing of material issues used. You NEED NOT draw up the Stores Ledgers.

Answer : (A)

(a) Value of Material Exe consumed during the period 1-4-88 to 15-4-88 by using FIFO method.

Date	*Description*	*Qty. Units*	*Rate Rs.*	*Amount Rs.*
1.4.88	Opening balance	100	5	500
5.4.88	Purchased	300	6	1,800
6.4.88	Issued	100	5	1,400
		150	6	
8.4.88	Purchased	500	7	3,500
10.4.88	Issued	150	6	2,650
		250	7	
12.4.88	Purchased	600	8	4,800
14.4.88	Issued	250	7	3,750
		250	8	
15.4.88	Balance	350	8	2,800

Total value of material Exe consumed during the period under FIFO method comes to (Rs. 1,400 + Rs. 2,650 – Rs. 3,750) Rs. 7,800 and balance on 15.04.88 is of Rs. 2,800.

Value of Material Exe consumed during the period 1.4.88 to 15.4.88 by using LIFO method

Date	*Description*	*Qty. Units*	*Rate Rs.*	*Amount Rs.*
1.4.88	Opening balance	100	5	500
5.4.88	Purchased	300	6	1.800
6.4.88	Issued	250	6	1.500
8.4.88	Purchased	500	7	3,500
10.4.88	Issued	400	7	2,800
12.4.88	Purchased	600	8	4,800
14.4.88	Issued	500	8	4,000
15.4.88	Balance	350	—	2,300

Total value of material Exe issued under LIFO method comes to (Rs. 1,500 + Rs. 2,800 + Rs. 4,000) Rs. 8,300

*The balance 350 units on 15.4.88; relates to opening balance on 1.4.88 and purchases made on 5.4.88; 8.4.88 and 12.4.88. (100 units @ Rs. 5; 50 units @ Rs. 6 ; 100 units @ Rs. 7 and 100 units @ Rs. 8).

(b) As shown in (a) above, the value of stock of material on 15.4.88;

Under FIFO method	Rs. 2,800
Under LIFO method	Rs. 2,300

(B) Total value of material Exe issued to production under FIFO and LIFO methods comes to Rs.7,800 and Rs. 8,300 respectively. The value of Closing Stock of material Exe on 15.4.88 under FIFO and LIFO methods comes to Rs. 2,800 and Rs. 2,300 respectively.

The reasons for the difference of Rs. 500 (Rs. 8,300 — Rs. 7,800) as shown by the following table in the value of material Exe. issued to production under FIFO & LIFO are as follows:

Date	*Quantity Issued (Units)*	*Value FIFO Rs.*	*Total Rs.*	*Value LIFO Rs.*	*Total*
6.4.88	250	1,400		1,500	
10.4.88	400	2,650		2,800	
14.4.88	500	3,750	7800	4,000	8,300

1. One 6.4.88 ; 250 units were issued to production. Under FIFO their value comes to Rs. 1,400 (100 units × Rs. 5 + 150 units × Rs. 6) and under LIFO Rs. 1,500 (250× Rs.6). Hence Rs. 100 was more charged to production under LIFO.

2. On 10.4.88 ; 400 units were issued to production. Under FIFO their value comes to Rs.2,650 (150 × Rs. 6 + Rs. 250 × Rs.7) and under LIFO Rs. 2,800 (400 × Rs. 7). Hence Rs. 150 was more charged to production under LIFO.

3. On 14.4.88 ; 500 units were issued to production Under FIFO their value comes to Rs.3,750 (250 × Rs. 7 + 250 × Rs. 8) and under LIFO Rs. 4,000 (500×Rs.8). Thus Rs. 250 was more charged to production under LIFO.

Thus the total excess amount charged to production under LIFO comes to Rs.500.

The reasons for the difference of Rs. 500 (Rs. 2,800 – Rs. 2,300) in the value of 350 units of Closing Stock of material Exe under FIFO and LIFO are as follows:

1. In the case of FIFO, all the 350 units of the closing stock belongs to the purchase of material made on 12.4.88; whereas under LIFO these units were from Opening Balance and purchases made on 5.4.88; 8.4.88 and 12.4.88.

2. Due to different purchase price paid by the concern on different days of purchase, the value of Closing Stock differed under FIFO and LIFO. Under FIFO 350 units of closing stock were valued @ Rs. 8 p.u. Whereas under LIFO first 100 units were valued @ Rs. 5 p.u.; next 50 units @ Rs. 6 p.u.; next 100 units @ Rs. 7 p.u. and last 100 units @ Rs. 8 p.u.

Thus under FIFO, the value of closing stock increased by Rs. 500.

Question 38

(a) Discuss briefly the considerations governing the fixation of the maximum and minimum levels of inventory.

(b) A company uses three raw materials A, B and C for a particular product for which the following data apply :–

Raw Material	*Usage per unit of product (Kgs)*	*Re-order Quantity (Kgs)*	*Price per Kg. Rs.*	*Delivery period (in weeks)*			*Re-order level (Kgs)*	*Minimum level (Kgs)*
				Minimum	*Average*	*Maximum*		
A	*10*	*10,000*	*0.10*	*1*	*2*	*3*	*8,000*	
B	*4*	*5,000*	*0.30*	*3*	*4*	*5*	*4,750*	
C	*6*	*10,000*	*0.15*	*2*	*3*	*4*		*2.000*

Weekly production varies from 175 to 225 units, averaging 200 units of the said product. What would be the following quantities:–

(i) Minimum Stock of A?

(ii) Maximum Stock of B?

(iii) Re-order level of C?

(iv) Average stock level of A?

Answer

(a) Considerations for the fixation of maximum level of inventory.

Maximum level of an inventory item is its maximum quantity held in stock at any time. The mathematical formula used for its determination is as follows:

Maximum level = Re-order level – (Minimum Consumption × Minimum Re-order period) + Re-order quantity.

The important considerations which should govern the fixation of maximum level for various inventory items are as follows:

(1) The fixation of maximum level of an inventory item requires information about re-order level. The re-order level itself depends upon its maximum rate of consumption and maximum delivery period. It in fact is the product of maximum consumption of inventory item and its maximum delivery period.

(2) Knowledge about minimum consumption and minimum delivery period for each inventory item should also be known.

(3) The determination of maximum level also requires the figure of economic order quantity. Economic order quantity means the quantity of inventory to be ordered so that total ordering and storage cost is minimum.

(4) Availability of funds, storage capacity, nature of items and their price also are important for the fixation of minimum level.

(5) In the case of important materials due to their irregular supply, the maximum level should be high.

Considerations for the fixation of minimum level of inventory

Minimum level indicates the lowest figures of inventory balance, which must be maintained in hand at all times, so that there is no stoppage of production due to non-availability of inventory. The formula used for its calculation is as follows:

Minimum level of inventory = Re-order level – (Average rate of consumption × Average time of inventory delivery).

The main considerations for the fixation of minimum level of inventory are as follows:

1. Information about maximum consumption and maximum delivery period in respect of each item to determine its re-order level.
2. Average rate of consumption for each inventory item.
3. Average delivery period for each item. The period can be calculated by averaging the maximum and minimum period.

(b) (i) Minimum stock of A

Re-order level – (Average rate of consumption × Average time required to obtain fresh delivery)

= 8,000 – (2,000 × 2) = 4,000 kgs.

(ii) Maximum stock of B

Re-order level – (Minimum Consumption × Minimum Re-order period) + Re-order quantity

= 4,750 – (4 × 175 × 3) + 5,000

= 9,750 × 2,100 = 7,650 kgs.

OR

(iii) Re-order level of C

Maximum re-order period × Maximum Usage

= 4 × 1,350 = 5,400 kgs.

OR

Re-order level of C

= Minimum stock of C+(Average rate of consumption × Average time required to obtain fresh delivery)

= 2,000 + [(200×6)×3] kgs.

= 5,600 kgs.

(iv) Average stock level of A

= Minimum stock level of A + $\frac{1}{2}$ Re-order quantity

= 4,000 + $\frac{1}{2}$ 10,000 = 4,000 + 5,000 = 9,000 kgs.

OR

Average Stock level of A

= $\frac{\text{Minimum stock} + \text{Maximum stock}}{2}$ (Refer to working note)

= $\frac{4,000 + 16,250}{2}$ = 10,125 kgs.

Working note

Maximum stock of A = ROL + ROQ – (Minimum consumption × Minimum

re-order period)

= 8,000 kgs + 10,000 – [(175×10)×1]

= 16,250 kgs.

Question 39

(a) *EXE Limited has received an offer of quantity discounts on his order of materials as under:–*

Price per tonne	*Tonnes*
Rs.	*Nos.*
1,200	*Less than 500*
1,180	*500 and less than 1,000*
1,160	*1,000 and less than 2,000*
1,140	*2,000 and less than 3,000*
1,120	*3,000 and above.*

The annual requirement for the material is 5,000 tonnes. The ordering cost per order is Rs. 1,200 and the stock holding cost is estimated at 20% of material cost per annum. You are required to complete the most economical purchase level.

(b) *What will be your answer to the above question if there are no discount offered and the price per tonne is Rs. 1,500?*

Answer (a)

Total Annual Requirement	*Order Size (units)*	*No. of Orders*	*Cost of Inventory S × Per unit cost*	*Ordering Cost*	*Carrying Cost p.u. p.a.*	*Total Cost*
(*S*)	q	$\frac{S}{q}$		$\frac{S}{q}$ × Rs. 1200	$\frac{1}{2}$ ×q×20% of per unit cost	(4+5+6)
			Rs.	Rs.	Rs.	Rs.
1	2	3	4	5	6	7
5000 units	400	12.5	60,00,000 (5,000 × Rs.1200)	15,000	48,000 (200 × Rs. 240)	60,63,000
	500	10	59,00,000 (5,000 × Rs.1180)	12,000	59,000 (250 × Rs. 236)	59,71,000
	1,000	5	58,00,000 (5,000 × Rs.1160)	6,000	1,16,000 (500 × Rs. 232)	59,22,000
	2,000	2.5	57,00,000 (5,000 × Rs.1140)	3,000	2,28,000 (1,000 × Rs. 228)	59,31,000
	3,000	1.666	56,00,000 (5,000 × Rs.1120)	2,000	3,36,000 (1500 × Rs. 224)	59,38,000

The above table shows that the total cost of 5000 units including ordering and carrying cost is minimum (Rs. 59,22,000) when the order size is 1000 units. Hence the most economical purchase level is 1000 units.

(b) EOQ = $\sqrt{\frac{2SCo}{iC_i}}$ Where S is the annual inventory requirement, Co, is the ordering cost per order and iC_1 is the carrying cost per unit per annum.

$$= \sqrt{\frac{2 \times 5000 \times Rs.1200}{20\% \times Rs.1500}} = 200 \text{ tonnes}$$

Question 40

About 50 items are required every day for a machine. A fixed cost of Rs. 50 per order is incurred for placing an order. The inventory carrying cost per item amounts to Rs. 0.02 per day. The lead period is 32 days compute.

(i) Economic Order Quantity

(ii) Re-order level *(November,1996, 2 marks)*

Answer

	Annual consumption (S)	=	50 items × 365 days
		=	18,250 items
	Fixed cost per order (C_o) (or ordering cost)	=	Rs. 50
	Inventory carrying cost per item per annum (iC_1)	=	Rs. 0.02 × 365 = Rs. 7.30
(i)	**Economic Order Quantity**	=	$\sqrt{\frac{2SC_0}{iC_1}}$
		=	$\sqrt{\frac{2 \times 18,250 \times Rs.50}{Rs.7.30}}$
		=	500 items
(ii)	**Re-order level**	=	*Maximum usage per day × Maximum lead time*
		=	50 items per day × 32 days.
		=	1,600 items

Question 41

A company has the option to procure a particular material from two sources:

Source I assures that defectives will not be more than 2% of supplied quantity.

Source II does not give any assurance, but on the basis of past experience of supplies received from it, it is observed that defective percentage is 2.8%.

The material is supplied in lots of 1,000 units. Source II supplies the lot at a price, which is lower by Rs. 100 as compared to Source I. The defective units of material can be rectified for use at a cost of Rs. 5 per unit.

You are required to find out which of the two sources is more economical

(May, 2001, 8 marks)

Answer

Comparative Statement of procuring material from two sources

	Material source I	*Material source II*
Defective (in %)	2	2.8
	(Future estimate)	*(Past experience)*
Units supplied (in one lot)	1,000	1,000
Total defective units in a lot	20	28
	(1,000 units×2%)	*(1,000 units ×2.8%)*
Additional price paid per lot (Rs.) (A)	100	–
Rectification cost of defect (Rs.) (B)	100	140
	(20 units Rs. 5)	*(28 units × Rs. 5)*
Total additional cost per lot (Rs.): [(A)+(B)]	200	140

Decision: On comparing the total additional cost incurred per lot of 1,000 units, we observe that it is more economical, if the required material units are procured from material source II.

Question 42

What is material handling cost? How will you deal it in cost account?

(May, 1999, 3 marks)

Answer

Material handling cost: It refers to the expenses involved in receiving, storing, issuing and handling materials. To deal with this cost in cost accounts there are two prevalent approaches as under:

First approach suggests the inclusion of these costs as part of the cost of materials by establishing a separate material handling rate e.g., at the rate of percentage of the cost of material issued or by using a separate material handling rate which may be established on the basis of weight of materials issued.

Under another approach these costs may be included along with those of manufacturing overhead and be charged over the products on the basis of direct labour or machine hours.

Question 43

The following data are available in respect of material X for the year ended 31st March 1997.

	Rs.
Opening stock	*90,000*
Purchases during the year	*2,70,000*
Closing stock	*1,10,000*

Calculate –

(i) Inventory turnover ratio; and

(ii) the number of days for which the average inventory is held (November, 1997, 4 marks)

Answer

(i) Inventory turnover ratio *(Refer to working note)*

$$= \frac{\text{Cost of stock of raw material consumed}}{\text{Average stock of raw material}}$$

$$= \frac{\text{Rs.2,50,000}}{\text{Rs.1,00,000}} = 2.5$$

(ii) Average number of days for which the average inventory is held

$$= \frac{365 \text{ days}}{\text{Inventory turnover ratio}} = \frac{365 \text{ days}}{2.5}$$

= 146 days

Working note:

		Rs.
Opening stock of raw material on 1.4.1996	=	90,000
Add: Material purchases during the year	=	2,70,000
Less: Closing stock of raw material	=	1,00,000
Cost of stock of raw material consumed		2,50,000

Average stock of raw material $= \frac{1}{2}\left\{\begin{matrix}\text{Opening stock of} \\ \text{raw material}\end{matrix} + \begin{matrix}\text{Closing stock of} \\ \text{raw material}\end{matrix}\right\}$

$= \frac{1}{2}\{\text{Rs. } 90{,}000 + \text{Rs.}1{,}10{,}000\} = \text{Rs.}1{,}00{,}000$

Question 44

M/s Tubes Ltd. are the manufacturers of picture tubes for T.V. The following are the details of their operation during 1997:

Average monthly market demand	*2,000 Tubes*
Ordering cost	*Rs. 100 per order*
Inventory carrying cost	*20% per annum*
Cost of tubes	*Rs. 500 per tube*
Normal usage	*100 tubes per week*
Minimum usage	*50 tubes per week*
Maximum usage	*200 tubes per week*
Lead time to supply	*6-8 weeks*

Compute from the above:

(1) Economic Order Quantity. If the supplier is willing to supply quarterly 1,500 units at a discount of 5%, is it worth accepting?

(2) Maximum level of stock

(3) Minimum level of stock

(4) Reorder level *(May, 1998, 5+2+2+1 marks)*

Answer

(1) S = Annual usage of tubes = Normal usage per week × 52 weeks

= 100 tubes × 52 weeks = 5,200 tubes

C_o = Ordering cost per order = Rs. 100/- per order

C_1 = Cost per tube = Rs. 500/-

$_iC_1$ = Inventory carrying cost per unit per annum

= 20% × Rs. 500 = Rs. 100/- per unit, per annum

Economic order quantity:

$$E.O.Q = \sqrt{\frac{2SC_O}{iC_1}} = \sqrt{\frac{2 \times 5{,}200 \text{ units} \times Rs.100}{Rs.100}} = 102 \text{ tubes (approx.)}$$

The supplier is willing to supply 1500 units at a discount of 5%, is it worth accepting

Total cost (when order size is 1500 units) = Cost of 5,200 units + Ordering cost + Carrying cost.

$$= 5{,}200 \text{ units} \times Rs.\ 475 + \frac{5{,}200 \text{ units}}{1{,}500 \text{ units}} \times Rs.100 + \frac{1}{2} \times 1{,}500 \text{ units} \times 20\% \times Rs.\ 475$$

= Rs. 24,70,000 + Rs. 346.67 + Rs. 71,250

= Rs. 25,41,596.67

Total cost (when order size is 102 units)

$$= 5{,}200 \text{ units} \times Rs.\ 500 + \frac{5{,}200 \text{ units}}{102 \text{ units}} Rs.\ 100 + \frac{1}{2} 102 \text{ units} \times 20\% \times Rs.\ 500$$

= Rs. 26,00,000 + Rs. 5,098.03 + Rs. 5,100

= Rs. 26, 10,198.03

Since, the total cost under quarterly supply of 1,500 unit with 5% discount is lower than that when order size is 102 units, therefore the offer should be accepted. While accepting this offer consideration of capital blocked on order size of 1,500 units per quarter has been ignored.

(2) Minimum level of stock

= Re-order level + Reorder quantity – Min. usage × Min. reorder period

= 1,600 units + 102 units – 50 units × 6 weeks

= 1,402 units.

(3) Minimum level of stock

= Re-order level – Normal usage × Average reorder period

= 1,600 units – 100 units × 7 weeks = 900 units.

(4) Reorder level

= Maximum consumption × Maximum re-order period

= 200 units × 8 weeks

= 1,600 units

Question 45

At the time of physical stock taking, it was found that actual stock level was different from the clerical or computer records. What can be possible reasons for such differences? How will you deal with such differences? (May, 1999, 5 marks)

Answer

Possible reasons for differences arising at the time of physical stock taking may be as follows when it was found that actual stock level was different from that of the clerical or computer records:

(i) Wrong entry might have been made in stores ledger account or bin card,

(ii) The items of materials might have been placed in the wrong physical location in the store,

(iii) Arithmetical errors might have been made while calculating the stores balances on the bin cards or store-ledger when a manual system is operated,

(iv) Theft of stock.

When a discrepancy is found at the time of stock taking, the individual stores ledger account and the bin card must be adjusted so that they are in agreement with the actual stock. For example, if the actual stock is less than the clerical or computer record the quantity and value of the appropriate store ledger account and bin card (quantity only) must be reduced and the difference in cost be charged to a factory overhead account for stores losses.

Question 46

G. Ltd. produces a product which has a monthly demand of 4,000 units. The product requires a component X which is purchased at Rs. 20. For every finished product, one unit of component is required. The ordering cost is Rs. 120 per order and the holding cost is 10% p.a.

You are required to calculate:

(i) Economic order quantity

(ii) If the minimum lot size to be supplied is 4,000 units, what is the extra cost, the company has to incur?

(iii) What is the minimum carrying cost, the company has to incur? (May, 1999, 6 marks)

Answer

(i) Economic order quantity*:*

S (Annual requirement = 4,000 units per month × 12 months = 48,000 unit of Component 'X')

C_1 (Purchase cost p.u.) = Rs.20

C_o (Ordering cost per order) = Rs.120

i (Holding cost) = 10% per annum

$$\text{E.O.Q.} = \sqrt{\frac{2SC_0}{iC_1}} = \sqrt{\frac{2 \times 48{,}000 \text{ units} \times \text{Rs.}120}{10\% \times \text{Rs.}20}}$$

= 2,400 units

(ii) Extra cost incurred by the company

Total cost = Total ordering cost + Total carrying cost

(when order size is 4,000 units)

$$= \frac{S}{q} \times Co + \frac{1}{2} q\,(iC_1)$$

$$= \frac{48{,}000 \text{ units}}{4{,}000 \text{ units}} \times \text{Rs.}120 + \frac{1}{2} \times 4{,}000 \text{ units} \times 10\% \times \text{Rs.}20$$

= Rs. 1,440 + Rs. 4,000 = Rs. 5,440 ...(a)

Total cost $= \frac{48{,}000 \text{ units}}{2{,}400 \text{ units}} \times \text{Rs.}120 + \frac{1}{2} \times 2{,}400 \text{ units} \times 10\% \times \text{Rs.}20$

(when order size is 2,400 units) = Rs. 2,400 + Rs. 2,400 = Rs. 4,800 ...(b)

Extra cost (a) – (b) = Rs. 5,440 – Rs. 4,800 = Rs. 640
(incurred by the company)

(iii) Minimum carrying cost:

Carrying cost depends upon the size of the order. It will be minimum on the least order size.

(In this part of the question the two order sizes are 2,400 units and 4,000 units. Here 2,400 units is the least of the two order sizes. At this order size carrying cost will be minimum)

The minimum carrying cost in this case can be computed as under:

Minimum carrying cost $= \frac{1}{2} \times 2{,}400 \text{ units} \times 10\% \times \text{Rs. } 20 = \text{Rs. } 2{,}400$

Question 47

If the minimum stock level and average stock level of raw-material A are 4,000 and 9,000 units respectively, find out its 'Re-order quantity' *(May, 1997, 2 marks)*

Answer

Minimum stock level of material A		=	4,000 units
Average stock level of material A		=	9,000 units
Average stock level		=	Minimum stock level' + 1/2 Re-order quantity
or	1/2 Reorder quantity	=	9,000 units - 4,000 units
			5,000 units
or	Re-order quantity	=	10,000 units.

Question 48

PQR Tubes Ltd. are the manufacturer of picture tubes for T.V. The following are the details of their operations during 1999-2000.

Ordering cost	*Rs. 100 per order*
Inventory carrying cost	*20% p.a.*
Cost of tubes	*Rs. 500 per tube*
Normal usage	*100 tubes per week*
Minimum usage	*50 tubes per week*
Maximum usage	*200 tube per week*
Lead time to supply	*6 – 8 weeks*

Required

(i) Economic order quantity. If the supplier is willing to supply quarterly 1,500 units at a discount of 5%, is it worth accepting?

(ii) Re-order level

(iii) Maximum level of stock

(iv) Minimum level of stock *(May, 2000, 4 marks)*

Answer

(i) Economic order quantity (EOQ) = $\sqrt{\frac{2\,SC_0}{iC_1}}$

Here S is the annual requirement of tubes, q is the order size

C_0 is the ordering cost per order.

iC_1 is the inventory carrying cost p.u. p.a.

$$E.O.Q. = \sqrt{\frac{2 \times (100 \text{ tubes} \times 52 \text{ weeks}) \ (Rs.100 \text{ per order})}{20\% \times Rs.500}}$$

$$E.O.Q = \sqrt{\frac{2 \times 5{,}200 \text{ tubes} \times Rs.100}{Rs.100}} = 102 \text{ tubes (approx.)}$$

$(T.C.)_{q=102 \text{ units}}$ = Total purchase cost of 5,200+Total ordering cost + Total carrying cost

$$= 5{,}200 \text{ units} \times Rs.500 + \frac{5{,}200 \text{ units}}{102 \text{ units}} \times Rs.100 + \frac{1}{2} \times 102 \text{ units} \times Rs.\ 100$$

= Rs. 26,00,000 + Rs. 5,098 + Rs. 5,100

= Rs. 26,10,198

Total cost (when the supplier is willing to give a discount of 5% on an order size of 1,500 units) will be:

$$(TC)_{q=1,500 \text{ units}} = 5{,}200 \text{ units} \times Rs.\ 475 + \frac{5{,}200 \text{ units}}{1{,}500 \text{ units}} \times Rs.\ 100 + \frac{1}{2} \times 1{,}500 \text{ units} \times 20\% \times Rs.475$$

= Rs. 24,70,000 + Rs. 346.66 + Rs. 71,250

= Rs. 25,41,596.66 approx.

Decision: Since the total cost of inventory when supplier supplies quarterly 1,500 units at a discount of 5% is less than that when the order size is of 102 units. Therefore, it is advisable to accept the offer of 5% discount and save a sum of Rs. 68,601.34 (Rs. 26,10,198 – Rs.25,41,596.66)

Note: *In the case of E.O.Q. the total ordering cost and the total carrying cost are always equal, but in the above case it is not so because of the approximation made in arriving at the figure of E.O.Q.*

(ii) Re-order level (ROL)

= Maximum usage × Maximum lead time to supply

= 200 tubes per week × 8 weeks

= 1,600 tubes

(iii) Maximum level of stock

= Re-order level + Re-order quantity – Minimum usage × Minimum lead time to supply

= 1,600 tubes + 102 tubes – 50 tubes × 6 weeks

= 1,402 tubes

(iv) Minimum level of stock

= Re-order level – Normal usage × Average lead time to supply

= 1,600 tubes – 100 tubes × 7 weeks.

= 900 tubes

Question 49

Distinguish clearly between bincard and stores ledger. *(May, 2000, 4 marks)*

Answer

Distinction between bin card and store ledger.

Both bin card and stores ledger are perpetual inventory records. None of them is a substitute for the other. These two records may be distinguished from the following points of view:

(i) Bin card is maintained by the store-keeper, while the cost accounting department maintains the stores ledger.

(ii) Bin card is, the stores recording document whereas the stores ledger is an accounting record.

(iii) Bin card contains information with regard to quantities i.e. their receipt, issue and balance while the stores ledger contains both quantitative and value information in respect of their receipts, issue and balance.

(iv) In the bin card entries are made at the time when transaction takes place. But in the stores ledger entries are made only after the transaction has taken place.

(v) Inter departmental transfers of materials appear only in stores ledger.

(vi) Bin cards record each transaction but stores ledger records the same information in a summarized form.

Question 50

RST Limited has received an offer of quantity discount on its order of materials as under:

Price per tone	*Tones number*
Rs, 9,600	*Less than 50*
Rs.9,360	*50 and less than 100*
Rs. 9,120	*100 and less than 200*
Rs. 8,880	*200 and less than 300*
Rs. 8,640	*300 and above*

The annual requirement for the material is 500 tonnes. The ordering cost per order is Rs.12,500 and the stock holding cost is estimated at 25% of the material cost per annum.

Required

(i) Compute the most economical purchase level.

(ii) Compute EOQ if there are no quantity discounts and the price per tonne is Rs.10,500.

(November, 2004, 4+2=6 marks)

Answer

(i)

Order size (Q) (Units)	*No. of orders A/Q (Units)*	*Cost of purchase Ax per unit cost*	*Carrying cost* $\frac{A}{Q}$ *×Rs.12500*	*Carrying cost* $\frac{Q}{2}$ *×C×25%*	*Total cost (3+4+5)*
(1)	(2)	(3)	(4)	(5)	(6)
10	12.5	48,00,000 (500×9600)	1,56,250	48,000 $\left(\frac{40}{2}\times 9600\times 0.25\right)$	50,04,250
50	10	46,80,000 (500×9360)	1,25,000	58,500 $\left(\frac{50}{2}\times 9360\times 0.25\right)$	48,63,500
100	5	45,60,000 (500×9120)	62,500	1,14,000 $\left(\frac{100}{2}\times 9120\times 0.25\right)$	47,36,500
200	2.5	44,40,000 (500×8880)	31,250 (2.5×12500)	2,22,000 $\left(\frac{200}{2}\times 8880\times 0.25\right)$	46,93,250
300	1.67	43,20,000 (500×8640)	20,875 (1.67×12500)	3,24,000 $\left(\frac{300}{2}\times 8640\times 0.25\right)$	46,64,875

The above table shows that the total cost of 500 units including ordering and carrying cost is minimum (Rs. 46,64,875) where the order size is 300 units. Hence the most economical purchase level is 300 units.

(ii) EOQ = $\sqrt{\frac{2AO}{c\times i}} = \sqrt{\frac{2\times 500\times 12500}{10500\times 25}}$ = 69 tonnes.

Question 51

IPL Limited uses a small casting in one of its finished products. The castings are purchased from a foundry. IPL Limited purchases 54,000 castings per year at a cost of Rs. 800 per casting.

The castings are used evenly throughout the year in the production process on a 360-day-per-year basis. The company estimates that it costs Rs.9,000 to place a single purchase order and about Rs.300 to carry one casting in inventory for a year. The high carrying costs result from the need to keep the castings in carefully controlled temperature and humidity conditions, and from the high cost of insurance.

Delivery from the foundry generally takes 6 days, but it can take as much as 10 days. The days of delivery time and percentage of their occurrence are shown in the following tabulation:

Delivery time (days)	:	6	7	8	9	10
Percentage of occurrence	:	*75*	*10*	*5*	*5*	*5*

Required:

(I) Compute the economic order quantity (EOQ).

(ii) Assume the company is willing to assume a 15% risk of being out of stock. What would be the safety stock? The re-order point?

(iii) Assume the company is willing to assume a 5% risk of being out of stock. What would be the safety stock? The re-order point?

(iv) Assume 5% stock-out risk. What would be the total cost of ordering and carrying inventory for one year?

(v) Refer to the original data. Assume that using process re-engineering the company reduces its cost of placing a purchase order to only Rs.600. In addition company estimates that when the waste and inefficiency caused by inventories are considered, the true cost of carrying a unit in stock is Rs. 720 per year.

(a) Compute the new EOQ.

(b) How frequently would the company be placing an order, as compared to the old purchasing policy? *(May, 2004, 9 marks)*

Answer

(i) Computation of economic order quantity (EOQ)

(A) Annual requirement = 54,000 castings

(C) Cost per casting = Rs. 800

(O) Ordering cost = Rs. 9,000 / order

(c × i) Carrying cost per casting p.a = Rs. 300

$$EOQ = \sqrt{\frac{2AO}{c \times i}} = \sqrt{\frac{2 \times 54000 \times 9000}{300}} = 1800 \text{ casting}$$

(ii) Safety stock

(Assuming a 15% risk of being out of stock)

Safety stock for one day = 54,000/360 days = 150 castings

Re-order point = Minimum stock level + Average lead time × Average consumption

= 150 + 6 × 150 = 1,050 castings.

(iii) Safety stocks

(Assuming a 5% risk of being out of stock)

Safety stock for three days = 150× 3 days = 450 castings

Re-order point = 450 casting + 900 castings =1,350 castings

(iv) Total cost of ordering = (54,000/1,800) × Rs. 9,000 = Rs. 2,70,000

Total cost of carrying = (450 + ½ × 1,800) Rs. 300 = Rs. 4,05,000

(v) (a) Computation of new EOQ:

$$EOQ = \sqrt{\frac{2 \times 54{,}000 \times 600}{720}} = 300 \text{ castings}$$

(b) Total number of orders to be placed in a year are 180. Each order is to be placed after 2 days (1 year = 360 days). Under old purchasing policy each order is placed after 12 days.

Question 52

Write short notes on any three of the following:

(i) Re-order quantity

(ii) Re-order level

(iii) Maximum stock level

(iv) Minimum stock level *(November, 2003, 6 marks)*

Answer

(i) Re-order quantity*:* It refers to the quantity of stock for which an order is to be placed at any one point of time. It should be such that it minimises the combined annual costs of-placing an order and holding stock. Such an ordering quantity in other words is known as economic order quantity (EOQ).

$$EOQ = \sqrt{\frac{2AO}{C \times i}}$$

A = Annual raw material usage quantity

O = Ordering cost per order

C = Cost per unit

i = Carrying cost percentage per unit per annum

(ii) Re-order level: It is the level at which fresh order should be placed for the replenishment of stock.

= Maximum re-order period × Maximum usage

$$= \text{Minimum level} + \left[\begin{matrix}\text{Average} \\ \text{consumption}\end{matrix} \times \begin{matrix}\text{Average time to} \\ \text{obtain fresh supplies}\end{matrix}\right]$$

(iii) Max stock level: It indicates the maximum figure of stock held at any time.

$$= \underset{\text{Level}}{\text{Re-order}} + \underset{\text{quantity}}{\text{Re-order}} - \left[\begin{matrix}\text{Minimum} \\ \text{consumption}\end{matrix} \times \begin{matrix}\text{Minimum} \\ \text{re-order} \\ \text{period}\end{matrix}\right]$$

(iv) Minimum stock level: It indicates the lowest figure of stock balance, which must be maintained in hand at all times, so that there is no stoppage of production due to non-availability of inventory.

$$= \underset{\text{level}}{\text{Re-order}} - \left[\begin{matrix}\text{Average rate of} \\ \text{consumption}\end{matrix} \times \begin{matrix}\text{Average time of} \\ \text{stock delivery}\end{matrix}\right]$$

Question 53

Discuss ABC analysis as a system of Inventory control. *(November, 2004, 4 marks)*

Answer

ABC Analysis as a system of inventory control

It exercises discriminating control over different items of stores classified on the basis of investment involved.

'A' category of items consists of only a small %age i.e. approximately 10% of total items handled by stores but requires heavy investment, about 70% of inventory value, because of their high prices or heavy requirement or both.

'B' category of items are relatively less important. They may be approximately 20% of the total items of materials handled by stores. The %age of investment required is approximately 20% of total investment in inventories.

'C' category of items do not require much investment. It may be about 10% of total inventory value but they are nearly 70% of the total items handled by store.

EOQ, re-order level concepts are usually used in case of 'A' category items.

Question 54

Distinguish between Bin Card and Stores Ledger *(November, 2004, 2 marks)*

Answer

Bin card and stores ledger

Bin card is quantitative record of stores receipt, issue and balance. Control over stock is more effective, in as much as comparison of actual quantity in hand at any time with the book balance are possible. Bin cards are kept attached to the bins or quite near thereto , so as to assist in the identification of stock.

Stores ledger is quantitative and value record of stores receipts, issue and balance. It is a subsidiary ledger to the main cost ledger. It is maintained by cost accounting deptt.

Question 55

Discuss the accounting treatment of spoilage and defectives in Cost Accounting.

(November, 2003, 4 marks)

Answer

Accounting treatment of spoilage and defectives in Cost Accounting:

Normal spoilage cost (which is inherent in the operation) are included in cost either by charging the loss due to spoilage to the production order or charging it to production overhead so that it is spread over all products. Any value realized from the sale of spoilage is credited to production order or production overhead account, as the case may be.

The cost of abnormal spoilage (i.e. spoilage arising out of causes not inherent in manufacturing process) is charged to the Costing Profit and Loss Account. When spoiled work is due to rigid specifications, the cost of spoiled work is absorbed by good production, while the cost of disposal is charged to production overheads.

The problem of accounting for defective work is the problem of accounting of the costs of rectification or rework. The possible ways of treatment are as below:

(i) Defectives that are considered inherent in the process and are identified as normal can be recovered by using the following methods:

- Charged to good products
- Charged to general overheads
- Charged to department overheads
- Charged to identifiable job.

(ii) If defectives are abnormal and are due to causes beyond the control of organisation, the rework, cost should be charged to Costing Profit and Loss Account.

Question 56

A company manufactures 5000 units of a product per month. The cost of placing an order is Rs. 100. The purchase price of the raw material is Rs. 10 per kg. The re-order period is 4 to 8 weeks. The consumption of raw materials varies from 100 kg to 450 kg per week, the average consumption being 275 kg. The carrying cost of inventory is 20% per annum.

You are required to calculate

(i) Re-order quantity

(ii) Re-order level

(iii) Maximum level

(iv) Minimum level

(v) Average stock level *(November, 2002, 6 marks)*

Answer

(i) Reorder Quantity (ROQ) = 1,196 kgs.
(Refer to working note)

(ii) Reorder level (ROL) = Maximum usage × Maximum re-order period

450 kgs × 8 weeks = 3,600 kgs

(iii) Maximum level = $ROL + ROQ - \left(\text{Min. usage} \times \text{Min. re-order period}\right)$

= 3,600 kgs + 1,196 kgs – [100 kgs.×4 weeks]

= 4,396 kgs.

(iv) Minimum level = ROL – $\left(\begin{matrix}\text{Normal}\\\text{usage}\end{matrix} \times \begin{matrix}\text{Normal}\\\text{re – order period}\end{matrix}\right)$

= 3,600 kgs. – [275 kgs × 6 weeks]

= 1,950 kgs.

(v) Average stock level = $\frac{1}{2}\left(\begin{matrix}\text{Maximum}\\\text{level}\end{matrix} + \begin{matrix}\text{Minimum}\\\text{level}\end{matrix}\right)$

= $\frac{1}{2}$ [4,396 kgs. + 1,950 kgs.]

= 3,173 kgs.

OR

= [Minimum level + $\frac{1}{2}$ ROQ]

= [1,950 kgs + $\frac{1}{2}$ × 1,196 kgs.]

= 2,548 kgs.

Working note

Annual consumption of raw material (S) = 14,300 kgs.

(275 kgs. × 52 weeks)

Cost of placing an order (C_0) = Rs. 100

Carrying cost per kg. Per annum (iC_1) = $\frac{20}{100}$ × Rs. 10 = Rs. 2

Economic order quantity (EOQ) = $\sqrt{\frac{2SC_0}{iC_1}}$

= $\sqrt{\frac{2 \times 14{,}300 \text{ kgs.} \times \text{Rs.}100}{\text{Rs. } 2}}$

= 1,196 Kgs.

Question 57

The Complete Gardener is deciding on the economic order quantity for two brands of lawn fertilizer: Super Grow and Nature's Own. The following information is collected.

	Fertilizer	
	Super Grow	*Nature's Own*
Annual Demand	*2,000 Bags*	*1,280 Bags*
Relevant ordering cost per purchase order	*Rs. 1,200*	*Rs. 1,400*
Annual relevant carrying cost per bag	*Rs. 480*	*Rs. 650*

Required:

(i) Compute EOQ for Super Grow and Nature's Own.

(ii) For the EOQ, what is the sum of the total annual relevant ordering costs and total annual relevant carrying costs for Super Grow and Nature's Own?

(iii) For the EOQ, Compute the number of deliveries per year for Super Grow and Nature's Own (November, 1999, 8 marks)

Answer

(i) $EOQ = \sqrt{\frac{2SC_0}{iC_1}}$ *

*Here S = Annual demand of fertilizer bags.

C_1 = Cost per bag.

C = Relevant ordering cost per purchase order

iC_1 = Annual relevant carrying cost per bag

EOQ for Super Grow Fertilizer

$$\sqrt{\frac{2 \times 2{,}000 \text{ bags} \times \text{Rs.}1{,}200}{\text{Rs.}480}} = 100 \text{ bags.}$$

EOQ for Nature's Own Fertilizer

$$\sqrt{\frac{2 \times 1{,}280 \text{ bags} \times \text{Rs.}1{,}400}{\text{Rs.}560}} = 80 \text{ bags.}$$

(ii) Total annual relevant costs for Super Grow Fertilizer

= Total annual relevant ordering costs + Total annual relevant carrying costs

$$= \frac{S}{EOQ} \times C_0 + \frac{1}{2} EOQ \times iC_1$$

$$= \frac{2{,}000 \text{ bags}}{100 \text{ bags}} \times \text{Rs. } 1{,}200 + \frac{1}{2} \times 100 \text{ bags} \times \text{Rs. } 480$$

= Rs. 24,000 + Rs. 24,000 = Rs. 48,000

Total annual relevant costs for Nature's Own Fertilizer

$$= \frac{1{,}280 \text{ bags}}{80 \text{ bags}} \times \text{Rs. } 1{,}400 + \frac{1}{2} \times 80 \text{ bags} \times \text{Rs. } 560$$

= Rs. 22,400 + Rs. 22,400 = Rs. 44,800

(iii) Number of deliveries for Super Grow Fertilizer per year.

$$= \frac{S}{EOQ} \text{ (annual demand of fertiliser bags)}$$

$$= \frac{2{,}000 \text{ bags}}{100 \text{ bags}} = 20 \text{ orders}$$

Numbers of deliveries for Nature's Own fertilizers per year.

$$= \frac{1{,}280 \text{ bags}}{80 \text{ bags}} = 16 \text{ orders}$$

Question 58

At what price per unit would Part No. A32 be entered in the Stores Ledger, if the following invoice was received from a supplier:

Invoice	*Rs.*
200 units Part No. A32 @ Rs. 5	*1,000.00*
Less: 20% discount	*200.00*
	800.00
Add: Excise Duty @ 15%	*120.00*
	920.00
Add Packing charges (5 non-returnable boxes)	*50.00*
	970.00

Notes:

(i) A 2 percent discount will be given for payment in 30 days.

(ii) Documents substantiating payment of excise duty is enclosed for claiming MODVAT credit. *(November, 1995, 4 marks)*

Answer

	Rs.
200 units net cost after trade discount	800
Add: Packing charges	50
Total cost for 200 units	850

$$\text{Cost per unit} = \frac{\text{Rs.}850}{200} = \text{Rs. } 4.25$$

Question 59

In a company weekly minimum and maximum consumption of material A are 25 and 75 units respectively. The re-order quantity as fixed by the company is 300 units. The material is received within 4 to 6 weeks from issue of supply order. Calculate Minimum level and maximum level of material A. (May, 1995, 6 Marks)

Answer

Minimum level

= *Re-order level – (Average rate of consumption × Average re-order period)*

= 450 units – (50 units × 5 weeks) *(Refer to Working Note)*

= 200 units

Maximum level

= ROL+ROQ – (Min. rate of consumption × Min. re-order period)

= 450 units + 300 units – (25 units × 4 weeks)

= 600 units

Working Note:

Re-order level = *Maximum usage per period × Maximum reorder period*

= 75 units × 6 weeks = 450 units

Question 60

A Ltd. is committed to supply 24,000 bearings per annum to B Ltd. on a steady basis. It is estimated that it costs 10 paise as inventory holding cost per bearing per month and that the set-up cost per run of bearing manufacture is Rs.324.

(i) What should be the optimum run size for bearing manufacture?

(ii) What would be the interval between two consecutive optimum runs?

(iii) Find out the minimum inventory cost per annum. (November, 2000, 10 marks)

Answer

(i) Optimum run size for bearing manufacture

$$= \sqrt{\frac{2 \times \text{Annual supply of bearings} \times \text{Set – up cost per production run}}{\text{Annual holding cost per bearing}}}$$

$$= \sqrt{\frac{2 \times 24{,}000 \text{ bearings} \times \text{Rs. } 324}{12 \text{ months} \times 0.10\text{P}}} = 3{,}600 \text{ bearings}$$

(ii) Interval between two consecutive optimum runs

$$= \frac{12 \text{ months}}{\left(\frac{\text{Annual production}}{\text{Optimum run size}}\right)}$$

$$= \frac{12 \text{ months}}{\left(\frac{24{,}000 \text{ bearings}}{3{,}600 \text{ bearings}}\right)} = \frac{12 \text{ months}}{6.66}$$

= 1.8 months for 55 days approximately.

(iii) Minimum inventory cost per annum

= Total production run cost + Total carrying cost per annum

$$= \frac{24{,}000 \text{ bearings}}{3{,}600 \text{ bearings}} \times \text{Rs.}324 + (1/2)\ 3{,}600 \text{ bearings} \times 0.10\text{P} \times 12 \text{ months}$$

= Rs. 2,160 + Rs. 2,160

= Rs. 4,320

Question 61

JP Limited, manufacturers of a special product, follows the policy of EOQ (Economic Order Quantity) for one of its components. The component's details are as follows:

	Rs.
Purchase Price Per Component	*200*
Cost of an Order	*100*
Annual Cost of Carrying one Unit in Inventory	*10% of Purchase Price*
Total Cost of Inventory and Ordering Per Annum	*4,000*

The company has been offered a discount of 2% on the price of the component provided the lot size is 2,000 components at a time.

You are required to:

(a) Compute the EOQ

(b) Advise whether the quantity discount offer can be accepted.

(Assume that the inventory carrying cost does not vary according to discount policy)

(c) Would your advice differ if the company is offered 5% discount on a single order?

(November, 1994, 16 marks)

Answer

(a) Computation of EOQ

(i)	Purchase price per component (C_1)	Rs. 200
(ii)	Cost of an order (C_0)	Rs. 100
(iii)	Annual cost of carrying one unit of inventory is ($i \times C_1$)	10% of C_1 or Rs. 20
(iv)	Total cost of (carrying) inventory and ordering per annum	Rs. 4,000
(v)	Let the total annual inventory usage be S.	

To compute E.O.Q. by using the above data we require the figure of total annual usage of inventory. This can be determined by making use of the following relation.

$\sqrt{2SC_0iC_1}$ = Rs. 4,000

OR $\sqrt{2S \times Rs.100 \times Rs.20}$ = Rs. 4,000

Or $\sqrt{Rs.4000S}$ = Rs. 4,000

Or S = 4,000 units

Now

$$E.O.Q. = \sqrt{\frac{2SC_0}{iC_1}} = \sqrt{\frac{2 \times 4000 \times Rs.100}{Rs.20}}$$

= 200 units

(b) No. of orders = 2

(when order size is 2,000 units)

Total cost = Ordering Cost + Carrying Cost

= 2× Rs. 100 + 1/2 × 2,000 units × Rs. 20

= Rs. 200 + Rs. 20,000 = Rs. 20,200

∴ Extra cost = Rs. 20,000 – Rs. 4,000 = Rs. 16,200

Quantity discount received = 2% × 4,000 units × Rs. 200

= Rs. 16,000

Advice to Management: The quantity discount offer should not be accepted as it results in additional expenditure of Rs. 200 (Rs. 16,200 – Rs. 16,000)

(c) No. of orders = 1

(when order size is 4,000 units)

Total cost = 1 × Rs. 100 + 1/2 × 4,000 units × Rs. 20 = Rs. 40,100

∴ Extra cost = Rs. 40,100 – Rs. 4,000 = Rs. 36,100

Quantity discount received = 5% × 4,000 units × Rs. 200

= Rs. 40,000

Advice to Management: The quantity discount after should be accepted as it result in reducing the total cost of carrying and ordering of inventory to the extent of Rs. 3,900 [Rs. 40,000 – Rs. 36,1000].

Note: White solving this problem, total cost of inventory and ordering per annum, has been considered as total cost of carrying inventory and ordering per annum.

Question 62

From the details given below, calculate

(i) Re-ordering level

(ii) Maximum level

(iii) Minimum level

(iv) Danger level

Re-ordering quantity is to be calculated on the basis of following information:

Cost of placing a purchase order is Rs. 20

Number of units to be purchased during the year is 5,000.

Purchase price per unit inclusive of transportation cost is Rs. 50.

Annual cost of storage per unit is Rs. 5.

Details of lead time: *Average 10 days, Maximum 15 days, Minimum 6 days. For emergency purchases 4 days.*

Rate of consumption: *Average: 15 units per day, Maximum : 20 units per day.*

(May, 1996, 8 marks)

Answer

Basic data:

Co	(Ordering Cost per order)	=	Rs. 20
S	(Number of units to be purchased annually)	=	5,000 units
C_1	(Purchase price per unit inclusive of transportation cost)	=	Rs. 50
iC_1	(Annual cost of storage per unit)	=	Rs. 5

Computations

(i) Re-ordering level = Maximum usage × Maximum re-order
(ROL) per period period

= 20 units per day × 15 days

= 300 units

(ii) Maximum level = ROL + ROQ – $\left[\begin{matrix}\text{Min.rate} \\ \text{of consumption}\end{matrix} \times \begin{matrix}\text{Min.reorder} \\ \text{period}\end{matrix}\right]$

(Refer to working note 1 and 2)

= 300 units + 200 units – $\left[\begin{matrix}\text{10 units} \\ \text{per day}\end{matrix} \times \text{6 days}\right]$

= 440 units

(iii) Minimum level = ROL – $\left[\begin{matrix}\text{Average rate} \\ \text{of consumption}\end{matrix} \times \begin{matrix}\text{Average reorder} \\ \text{period}\end{matrix}\right]$

= 300 units – (15 units per day × 10 days)

= 150 units

(iv) Danger level = Average consumption × Lead time for emergency purchases

= 15 units per day × 4 days

= 60 units

Working Notes:

1. ROQ = $\sqrt{\frac{2SC_0}{iC_1}}$ = $\sqrt{\frac{2 \times 5{,}000 \text{ units} \times \text{Rs.}20}{\text{Rs. } 5}}$

= 200 units

2. Average rate of consumption = $\frac{\text{Minimum rate of consumption (x) + Maximum rate of consumption}}{2}$

15 units per day = $\frac{x + 20 \text{ units per day}}{2}$

or x = 10 units per day

Question 63

Write short notes:

ABC Analysis *(May, 1996, 4 marks)*

Answer

ABC Analysis: It is a system of inventory control. It exercises discriminating control over different items of stores classified on the basis of the investment involved. Usually the items are divided into three categories according to their importance, namely, their value and frequency of replenishment during a period.

(i) 'A' Category of items consists of only a small percentage i.e., about 10% of the total items handled by the stores but require heavy investment about 70% of inventory value, because of their high prices and heavy requirement.

(ii) 'B' Category of items are relatively less important; they may be 20% of the total items of material handled by stores. The percentage of investment required is about 20% of the local investment in inventories.

(iii) 'C' Category of items do not require much investment; it may be about 10% of total inventory value but they are nearly 70% of the total items handled by store.

'A' category of items can be controlled effectively by using a regular system which ensures neither over-stocking nor shortage of materials for production. Such a system plans its total material requirements by making budgets. The stocks of materials are controlled by fixing certain levels like maximum level, minimum level and re-order level. A reduction in inventory management costs is achieved by determining economic order quantities after taking into account ordering cost and carrying cost. To avoid shortage and to minimize heavy investment in inventories, the techniques of value analysis, variety reduction, standardization etc, may be used.

In the case of 'B' category of items, as the sum involved is moderate, the same degree of control as applied in 'A' category of items is not warranted. The orders for the items, belonging to this category may be placed after reviewing their situation periodically.

For 'C' category of items, there is no need of exercising constant control. Orders for items in this group may be placed either after six months or once in a year, after ascertaining consumption requirements. In this case the objective is to economise on ordering and handling costs.

The advantages of ABC analysis are the following: -

(i) It ensures that, without there being any danger of interruption of production for want of materials or stores, minimum investment will be made in inventories of stocks of materials or stocks to be carried.

(ii) The cost of placing orders, receiving goods and maintaining stocks is minimized specially if the system is coupled with the determination of proper economic order quantities.

(iii) Management time is saved since attention need be paid only to some of the items rather than all the items as would be the case if the ABC system was not in operation.

(iv) With the introduction of the ABC system, much of the work connected with purchases can be systematized on a routine basis to be handled by sub-ordinate staff.

Question 64

Distinguish between Bin Card and Stores Ledger. *(May, 2003, 2 marks)*

Answer

Bin card & Stores ledger: Bin card is a quantitative record of stores, receipt, issue and balance. It is kept for each & every item of store by the store keeper. They are kept attached to the bins or receptacles or placed quite near thereto so that these also assist in the identification of stock. Here, the balance is taken out after each receipt or issue transaction.

Stores ledger is a collection of cards or loose leaves specially ruled for maintaining a record of both quantity and cost of stores items received. It also maintains record of stores receipt, issue and balance in respect of each item of inventory. Entries in this ledger are made from goods received notes and material requisitions.

Question 65

Discuss the accounting treatment of spoilage and defectives in cost accounting

(May, 2003, 3 marks)

Answer

Accounting treatment of spoilage & defectives in cost accounts:

Normal spoilage (i.e. which is inherent in the operation) costs are included in cost either by charging the loss due to spoilage to the production order or by charging it to production overhead so that it is spread over all the products. Any value realized from the sale of spoilage is credited to production order or production overhead account, as the case may be. The cost of abnormal spoilage are charged to Costing Profit & Loss Account.

Defectives that are considered inherent in the process and are identified as normal can be recovered by using any one of the following method.

- Charged to good products
- Charged to general overheads
- Charged to departmental overheads

If defectives are abnormal, they are to be debited to Costing Profit & Loss Account.

Question 66

A company manufactures a product from a raw material, which is purchased at Rs.60 per kg. The company incurs a handling cost of Rs. 360 plus freight of Rs. 390 per order. The incremental carrying cost of inventory of raw material is Re. 0.50 per kg. per month. In addition, the cost of working capital finance on the investment in inventory of raw material is Rs. 9 per kg. per annum. The annual production of the product is 1,00,000 units and 2.5 units are obtained from one kg of raw material.

Required

(i) Calculate the economic order quantity of raw materials.

(ii) Advise, how frequently should orders for procurement be placed.

(iii) If the company proposes to rationalize placement of orders on quarterly basis, what percentage of discount in the price of raw materials should be negotiated?

(November, 2001, 10 marks)

Answer

S (Annual requirement of raw material in kgs.) = 1 kg. × 1,00,000 units / 2.5 units = 40,000 kgs.

C_0 (Handling & freight cost per order) = Rs. 360 + Rs. 390 = Rs. 750

iC_1 (Carrying cost per unit per annum + Investment cost per Kg. per annum)

= (0.5 × 12 months) + Rs. 9 (investment in inventory per kg. per annum)

= Rs. 15 per unit

(i) E.O.Q. $= \sqrt{\frac{2 \times 40{,}000 \text{kgs.} \times \text{Rs. } 750}{\text{Rs. } 15}} = 2{,}000$ Kgs.

(ii) Frequency of orders for procurement:

S (Annual consumption) = 40,000 kgs.

Quantity per order = 2,000 kgs.

No. of orders per annum = 20 (40,000 kgs / 2,000 kgs.)

Frequency of placing orders 0.6 months or 18 days (approx.)

(12 months / 20 orders) or 365 days / 20 orders

(iii) Percentage of discount in the price of raw materials to be negotiated:

Quarterly orders = 10,000 kgs. Per order

(40,000 kgs / 4 orders)

No. of orders = 4

Total cost

(when order size is 10,000 units)

Order placing cost		Rs.3,000
(4 orders × Rs.750)		
Carrying cost		Rs.75,000
(10,000/2×Rs.15)		*Rs.78,000*

Total Cost

(When order size is equal to EOQ)

No. of orders	20	
Order placing cost	(20 orders × Rs. 750)	Rs. 15,000
Carrying cost	(2,000/2 × Rs. 15)	Rs. 15,000
		Rs.30,000
Increase in cost to be compensated by discount:		*Rs.48,000*

(Rs. 78,000 – Rs. 30,000)

Reduction per kg. In the purchase price of raw material: Rs. 1.20 per unit

(Rs. 48,000/40,000 Kgs.)

Percentage of discount in the price of raw material to be negotiated : 2% discount

(Rs. 20/60) × 100

Question 67

The quarterly production of a company's product which has a steady market is 20,000 units. Each unit of a product requires 0.5 Kg. of raw material. The cost of placing one order for raw material is Rs. 100 and the inventory carrying cost is Rs.2 per annum. The lead time for procurement of raw material is 36 days and a safety stock of 1,000 kg. of raw materials is maintained by the company. The company has been able to negotiate the following discount structure with the raw material supplier.

Order quantity Kgs.	*Discount Rs.*
Upto 6,000	*NIL*
6,000 – 8,000	*400*
8,000 – 16,000	*2,000*
16,000 – 30,000	*3,200*
30,000 – 45,000	*4,000*

You are required to

(i) Calculate the re-order point taking 30 days in a month.

(ii) Prepare a statement showing the total cost of procurement and storage of raw material after considering the discount of the company elects to place one, two, four or six orders in the year.

(iii) State the number of orders which the company should place to minimize the costs after taking EOQ also into consideration (May, 2002, 8 marks)

Answer

Working notes

1. Annual production (units) 80,000
   (20,000 units per quarter × 4 quarters)

2. Raw material required for 80,000 units in kgs. 40,000
   (80,000 units × 0.5 kgs.)

3. EOQ = $\sqrt{\frac{2 \times 40{,}000 \text{ kgs.} \times \text{Rs.}100}{\text{Rs.}2}} = 2{,}000$ kgs.

4. Total cost of procurement and storage when the order size is equal to EOQ or 2,000 kgs.

No. of orders *(40,000 kgs. / 2,000 kgs.)*	20
Ordering cost (Rs.) *(20 orders × Rs. 100)*	2,000
Carrying cost (Rs.) *(½ × 2,000 kgs. × Rs. 2)*	2,000
Total cost	4,000

(i) Reorder point = Lead time consumption + Safety stock
= 4,000 kgs. + 1,000 kgs. = 5,000 kgs.
(40,000 kgs. / 360 days) × 36 days.

(ii) Statement showing the total cost of procurement and storage of raw materials

(after considering the discount)

Order size	*No. of orders*	*Total cost of procurement*	*Average stock*	*Total cost of storage of raw materials*	*Discount*	*Total cost*
Kgs.		*Rs.*	*Kgs.*	*Rs.*	*Rs.*	*Rs.*
(1)	(2)	(3)=(2)×Rs.100	(4)=½×(1)	(5)=(4)×Rs.2	(6)	(7)=[(3)+(5)–(6)
40,000	1	100	20,000	40,000	4,000	36,100
20,000	2	200	10,000	20,000	3,200	17,000
10,000	4	400	5,000	10,000	2,000	8,400
6666.66	6	600	3,333	6,666	400	6,866

(iii) Number of orders which the company should place to minimize the costs after taking EOQ also into consideration is 20 orders each of size 2,000 kgs. The total cost of procurement and storage in this case comes to Rs. 4,000, which is minimum.

(Refer to working notes 3 and 4)

Question 68

Write short note on perpetual inventory control.

Answer

Perpetual Inventory: It represents a system of records maintained by the stores in department. It in fact comprises of:

(i) Bin Cards, and

(ii) Stores Ledger

Bin Card maintains a quantitative record of receipts, issues and closing balances of each item of stores. Separate bin cards are maintained for each item. Each card is filled up with the physical movement of goods i.e. on its receipt and issue.

Like bin cards, the Stores Ledger is maintained to record all receipt and issue transactions in respect of materials. It is filled up with the help of goods received note and material requisitions.

A perpetual inventory is usually checked by a programme of continuous stock taking. Continuous stock taking means the physical checking of those records (which are maintained under perpetual inventory) with actual stock. Perpetual inventory is essentially necessary for material control. It incidentally helps continuous stock taking.

The success of perpetual inventory depends upon the following: -

(a) The Stores Ledger-(showing quantities and amount of each item)

(b) Stock Control Cards (or Bin Cards)

(c) Reconciling the quantity balances shown by (a) & (b) above'

(d) Checking the physical balances of a number of items every day systematically and by rotation

(e) Explaining promptly the causes of discrepancies, if any, between physical balances and book figures

(f) Making corrective entries were called for after step (e) and

(g) Removing the causes of the discrepancies referred to step (e).

The main advantages of perpetual inventory are as follows :

(1) Physical stocks can be counted and book balances adjusted as and when desired without waiting for the entire stock-taking to be done.

(2) Quick compilation of Profit and Loss Accounts (for interim period) due to prompt availability of stock figures.

(3) Discrepancies are easily located and thus corrective action can be promptly taken to avoid their recurrence.

(4) A systematic review of the perpetual inventory reveals the existence of surplus, dormant, obsolete and slow-moving materials, so that remedial measures may be taken in time.

(5) Fixation of the various levels and check of actual balances in hand with these levels assist the Storekeeper in maintaining stocks within limits and in initiating purchase requisitions for correct quantity at the proper time.

Question 69

Raw materials 'X' costing Rs. 100 per kilogram and 'Y' costing Rs. 60 per kilogram are mixed in equal proportions for making product 'A'. The loss of material in processing works out to 25% of the output. The production expenses are allocated at 50% of direct material cost. The end product is priced with a margin of $33\frac{1}{3}$ *% over the total cost. Material 'Y' is not easily available and substitute raw material 'Z' has been found for 'Y' costing Rs. 50 per kilogram. It is required to keep the proportion of this substitute material in the mixture as low at possible and at the same time maintain the selling price of the end product at existing levels and ensure the same quantum of profit as at present.*

You are required:

To compute what should be the ratio of mix of the raw materials X and Z.

Answer

Working Note:

(i) Percentage of loss on output: 25

Let 1 kg. be the output of product A,

then, 1.25 kg. will be the input of material X and Y.

Proportion of material X and Y in the output 1 kg. of product A is:

X: 1.25 kg./2 = 0.625 kg.

Y:1.25kg./2 = 0.625kg.

(ii) Cost structure and price:

(for 1 kg. of product A)	*Rs.*
Material X: (0.625 kg. x Rs. 100)	62.50
Material Y: (0.625 kg. x Rs. 60)	37.50
Total Material Cost	100.00
Add: Production expenses (50% of material cost)	50.00
Total cost	150.00
Add: Profit $33\frac{1}{3}$ % of total cost	50.00
Selling price	200.00

Proportion of Materials X and Z in the Product A

Assume the minimum quantity of material Z in the product A as S kg. It means that (1.25-S) kg, of material X is required to be used for producing 1 kg. of Product A.

[Refer to Working Note (i)]

To maintain the level of profit and the selling price has shown by the Working Note (ii) it is necessary that the total cost of material in 1 kg. of product A should not exceed Rs. 100; i.e., S kg. x Rs. 50 + (1.250 - S) kg. x Rs. 100 = Rs. 100 or S = 0.5

Hence the quantity of X material = 1.25 kg. - 0.50 kg. = 0.75 kg.

Proportion of materials X and Z is: 0.75: 0.50 = 3:2.

Question 70

SK Enterprise manufactures a special product "ZE". The following particulars were collected for the year 2004:

Annual consumption	*12,000 units (360 days)*
Cost per unit	*Re. 1*
Ordering cost	*Rs. 12 per order*
Inventory carrying cost	*24%*
Normal lead time	*15 days*
Safety stock	*30 days consumption*

Required:

(i) Re-order quantity

(ii) Re-order level

(iii) What should be the inventory level (ideally) immediately before the material order is received? (2+1+1 = 4 marks)

Answer

(i) How much should be ordered each time i.e., Economic Order Quantity (EOQ)

$$EOQ = \sqrt{\frac{2AB}{CS}}$$

Where A is the annual consumption

B is the ordering cost per order

CS is the carrying cost per unit per annum

$$= \sqrt{\frac{2 \times 12{,}000 \times 12}{1 \times (24/100)}} = \sqrt{12{,}00{,}000}$$

= 1095.4 units or say 1,100 units.

(ii) When should the order be placed i.e., reordering level

Reordering level = *Safety stock +normal lead time consumption

$$\text{Reordering level} = \left[\frac{12000}{360} \times 30\right] + \left[\frac{12{,}000}{360} \times 15\right]$$

= 1,000+500 = 1,500 units.

(iii) What should be the inventory level (ideally) immediately before the material ordered is received i.e. the Safety Stock.

$$\text{*Safety Stock} = \left[\frac{12{,}000}{360} \times 30\right]$$

= 1,000 units.

Question 71

PQR Limited produces a product which has a monthly demand of 52,000 units. The product requires a component X which is purchased at Rs. 15 per unit. For every finished product, 2 units of Component X are required. The Ordering cost is Rs. 350 per order and the Carrying cost is 12% p.a.

Required:

(i) Calculate the economic order quantity for Component X.

(ii) If the minimum lot size to be supplied is 52,000 units, what is the extra cost, the company has to incur?

(iii) What is the minimum carrying cost, the Company has to incur?

Answer

(i) $\textbf{EOQ} = \sqrt{\frac{2AO}{c \times i}}$

$$= \sqrt{\frac{2 \times (52{,}000 \times 12) \times 350}{15 \times 0.12}}$$

= 15,578 units of components.

(ii) Extra cost incurred by the company

Total cost (when order size is 52,000 units) = Total ordering cost + Total carrying cost

$$= \frac{A}{Q} \times O + \frac{Q}{2} \times C \times i$$

$$= \left(\frac{52{,}000 \times 12}{52{,}000} \times \text{Rs.}350 \right) + \frac{52{,}000}{2} \times 15 \times 12\%$$

= Rs 4,200 + Rs 46,800

= Rs 51,000

Total cost when order size is 15,578 units

$$= \left(\frac{52{,}000 \times 12}{15{,}578} \times \text{Rs.}350 \right) + \frac{15{,}578}{2} \times 15 \times 12\%$$

= 14,020 + 14,020 = 28,040

Extra cost incurred = 51,000 – 28,040 = Rs 22,960

(iii) Minimum carrying cost, the company has to incur

$$= \frac{Q}{2} \times C \times i$$

$$= \frac{15,578}{2} \times Rs.15 \times 12\%$$

= Rs 14,020

Alternative solution

(a) Assuming the annual demand of '**x**' is 1,04,000 units (2 × 52,000 units) as per instruction that for every finished product , 2 units of component 'x' are required , the calculation of 2(a)(i),(ii) and (iii) will be as follows:

(i) $EOQ = \sqrt{\frac{2AO}{c \times i}}$

$$= \sqrt{\frac{2 \times (2 \times 52,000 \times 12) \times 350}{15 \times 0.12}}$$

= 22,030 units of component '**x**'

(ii) Extra cost incurred by the company

Total cost (when order size is 52,000 units) = Total ordering cost + Total carrying cost

$$= \frac{A}{Q} \times O + \frac{Q}{2} \times C \times i$$

$$= \left(\frac{2 \times 52,000 \times 12}{52,000} \times Rs.350 \right) + \frac{52,000}{2} \times 15 \times 12\%$$

= Rs. 55,200

Total cost (when order size is 20,030 units)

$$= \left(\frac{2 \times 52,000 \times 12}{22,030} \times Rs.350 \right) + \frac{22,030}{2} \times 15 \times 12\%$$

Total cost incurred = 19,828 + 19,827 = 39,655.

Extra cost incurred = 55,200 – Rs. 39,655 = Rs. 15,545.

(iii) Minimum carrying cost, the company has to incur

$$= \frac{Q}{2} \times C \times i$$

$$= \frac{22,030}{2} \times Rs.15 \times 12\%$$

= Rs. 19,827.

Question 72

PQR Ltd., manufactures a special product, which requires 'ZED'. The following particulars were collected for the year 2005-06:

(i)	*Monthly demand of Zed*	*7,500 units*
(ii)	*Cost of placing an order*	*Rs. 500*
(iii)	*Re-order period*	*5 to 8 weeks*
(iv)	*Cost per unit*	*Rs. 60*
(v)	*Carrying cost % p.a.*	*10%*
(vi)	*Normal usage*	*500 units per week*
(vii)	*Minimum usage*	*250 units per week*
(viii)	*Maximum usage*	*750 units per week*

Required:

(i) Re-order quantity.

(ii) Re-order level.

(iii) Minimum stock level.

(iv) Maximum stock level.

(v) Average stock level. *(4 + 10 = 14 Marks)*

Answer

(i) Re - order quantity $= \sqrt{\frac{2AO}{C \times i}}$

$$= \sqrt{\frac{2 \times 7,500 \times 12 \times 500}{60 \times 10}}$$

= 3,873 units

(ii) Re-order level

= Maximum re-order period × Maximum usage

$= 8 \text{ weeks} \times 750 \text{ units per week}$

= 6,000 units

(iii) Minimum stock level

= Re-order level – {Normal usage × Average reorder period}

= 6,000 – (500 × 6.5)

= 2,750 units

(iv) Maximum stock level

= Re-order level + Re-order quantity – (Minimum usage × Minimum re-order period)

= 6,000 + 3,873 – (5 × 250)

= 8,623 units

(v) Average stock level

= ½ (Minimum stock level + Maximum stock level)

= ½ (2,750 + 8,623)

= 5,687 units

Question 73

Raw materials 'AXE' costing Rs. 150 per kg. and 'BXE' costing Rs. 90 per kg. are mixed in equal proportions for making product 'A'. The loss of material in processing works out to 25% of the product. The production expenses are allocated at 40% of direct material cost. The end product is priced with a margin of 20% over the total cost.

Material 'BXE' is not easily available and substitute raw material 'CXE' has been found for 'BXE' costing Rs. 75 per kg. It is required to keep the proportion of this substitute material in the mixture as low as possible and at the same time maintain the selling price of the end product at existing level and ensure the same quantum of profit as at present.

You are required to compute the ratio of the mix of the raw materials 'AXE' and 'CXE.

(May 2007, 8 Marks)

Answer

Working Notes:

(i) Computation of material mix ratio:

Let 1 kg. of product A requires 1.25 kg. of input of materials A X E and B X E

Raw materials are mixed in equal proportions.

Then raw material A X E = $\frac{1.25}{2} = .625$ kg.

Then raw material B X E = $\frac{1.25}{2} = .625$ kg.

(ii) Computation of selling price / kg. of product A

	Rs.
Raw material A X E .625 kg. × 150 = Rs. 93.75	
Raw material B X E .625 kg. × 90 = Rs. 56.25	150.00
Production expenses (40% of material cost)	60.00
Total cost	210.00
Add: profit 20% of total cost	42.00
Selling price	252.00

Computation of proportions of materials A X E and C X E in 'A'

Let material C X E required in product A be m kg.

Then for producing 1 kg of product 'A', material A X E requirement = (1.25 – m) kg.

To maintain same level of profit and selling price as per Working note (ii), it is required that the total cost of material in 1 kg. of product A should not exceed Rs. 150,

i.e., m kg. × Rs. 75 + (1.25 – m) kg. × 150 = Rs. 150

or 75 m + 187.5 – 150 m = 150

or 75 m = 37.5

or m = 0.5 kg.

Raw material A X E requirement in product A = 1.25 – .5 = .75 kg.

So, proportion of material A X E and C X E

= .75 : .50

i.e. 3 : 2.

Question 74

Explain Bin Cards and Stock Control Cards. *(May 2007, 2 Marks)*

Answer

Bin Cards and Stores control cards:

Bin Cards are quantitative records of the stores receipt, issue and balance. It is kept for each and every item of stores by the store keeper. Here, the balance is taken out after each receipt or issue transaction

Stock control cards are also similar to Bin Cards. Stock control cards contain further informations as regards stock on order. These cards are kept in cabinets or trays or loose binders.

Question 75

Explain Economic Batch Quantity in Batch Costing. *(May 2007, 2 Marks)*

Answer

Economic Batch Quantity in Batch Costing

There are two types of costs involved in Batch Costing(i) set up costs(ii) carrying costs.

If the batch size is increased, set up cost per unit will come down and the carrying cost will increase. If the batch size is reduced, set up cost per unit will increase and the carry\ng cost will come down.

Economic Batch quantity will balance both these opponent costs. It is calculated as follows:

$$EBQ = \sqrt{\frac{2DS}{c}}$$

Where,

D	=	Annual Demand in units
S	=	Set up cost per batch
C	=	Carrying cost per unit per annum.

Question 76

A Company manufactures a special product which requires a component 'Alpha'. The following particulars are collected for the year 2008:

(i)	*Annual demand of Alpha*	*:*	*8,000 units*
(ii)	*Cost of placing an order*	*:*	*Rs. 200 per order*
(iii)	*Cost per unit of Alpha*	*:*	*Rs. 400*
(iv)	*Carrying cost % p.a.*	*:*	*20%*

The company has been offered a quantity discount of 4% on the purchase of 'Alpha', provided the order size is 4,000 components at a time.

Required:

(i) Compute the economic order quantity.

(ii) Advise whether the quantity discount offer can be accepted.

(November 2007, 5 Marks)

Answer

(a) $EOQ = \sqrt{\frac{2AO}{C \times i}}$

$= \sqrt{\frac{2 \times 8,000 \times 200}{400 \times 20\%}}$

= 200 units.

Calculation of total inventory cost p.a. at EOQ.

	Rs.
Purchase cost = 8,000 × 400	32,00,000
Ordering cost $\left(\frac{A}{Q} \times O = \frac{8,000}{200} \times 200\right)$ =	8,000
Carrying cost $\left(\frac{Q}{2} \times c \times i = \frac{200}{2} \times 400 \times 20\%\right)$ =	8,000
	32,16,000

Calculation of total inventory cost p.a. with quantity discount

	Rs.
Purchase cost = 8,000 × (400 – 4%)	30,72,000
Ordering cost $\left(\frac{A}{Q} \times O = \frac{8,000}{4,000} \times 200\right)$ =	400
Carrying cost = $\left(\frac{Q}{2} \times c \times i = \frac{4,000}{2} \times 384 \times 20\%\right)$ =	1,53,600
	32,26,000

(b) Quantity discount offered should not be accepted as it results in increase in total cost of inventory management by Rs. 10,000.

Question 77

Discuss the treatment of spoilage and defectives in Cost Accounting.

(November 2007, 4 Marks)

Answer

Treatment of spoilage and defectives in Cost Accounting: The normal spoilage cost (i.e. which is inherent in the operation) are included in cost either by charging the loss due to spoilage to production order or charging it to production overhead so that it is spread over all the products. Any value realized from sale of spoilage is credited to production order or production overhead account, as the case may be. The cost of abnormal spoilage (i.e. arising out of causes not inherent in manufacturing process) are charged to costing Profit and Loss Account.

The problem of accounting for defective work is that of accounting of the costs of rectification or rework.

The possible ways of treatment are as under:

For normal defectives:

(i) Charge to good products.

(ii) Charge to general overheads.

(iii) Charge to departmental overheads

(iv) Charge to Costing Profit and Loss Account if defectives are abnormal and due to causes beyond the control of organization.

Where defectives are easily identifiable with specific jobs, the works cost are debited to job.

Question 78

The following are the details of receipts and issues of a material of stores in a manufacturing company for the period of three months ending 30th June, 2008:

Receipts:

Date	*Quantity (kgs)*	*Rate per kg. (Rs.)*
April 10	*1,600*	*5*
April 20	*2,400*	*4.90*
May 5	*1,000*	*5.10*

May 17	*1,100*	*5.20*
May 25	*800*	*5.25*
June 11	*900*	*5.40*
June 24	*1,400*	*5.50*

There was 1,500 kgs. in stock at April 1, 2008 which was valued at Rs. 4.80 per kg.

Issues:

Date	*Quantity (kgs)*
April 4	*1,100*
April 24	*1,600*
May 10	*1,500*
May 26	*1,700*
June 15	*1,500*
June 21	*1,200*

Issues are to be priced on the basis of weighted average method. The stock verifier of the company reported a shortage of 80 kgs. on 31st May, 2008 and 60 kgs. on 30th June, 2008. The shortage is treated as inflating the price of remaining material on account of shortage.

You are required to prepare a Stores Ledger Account. (November 2008, 7 Marks)

Answer

Stores Ledger Account

for the three months ending 30th June, 2008

(Weighted Average Method)

		Receipts				***Issues***			***Balance***		
Date	*GRN No. MRR No.*	*Qty. (Kgs.)*	*Rates (Rs.)*	*Amounts*	*Requisit-ion. No.*	*Qty. (Kgs.)*	*Rates (Rs.)*	*Amount (Rs.)*	*Qty. (Kgs.)*	*Amount (Rs.)*	*Rate for further Issue (Rs.)*
2008											
April 1									1,500	7,200	4.80
April 4						1,100	4.80	5,280	400	1,920	4.80
April 10		1,600	5.00	8,000					2,000	9,920	$\frac{9,920}{2,000} = 4.96$
April 20		2,400	4.90	11,760					4,400	21,680	$\frac{21,680}{4,400} = 4.93$
April 24						1,600	4.93	7,888	2,800	13,792	$\frac{13,792}{2,800} = 4.93$
May 5		1,000	5.10	5,100					3,800	18,892	$\frac{18,892}{3,800} = 4.97$
May 10						1,500	4.97	7,455	2,300	11,437	$\frac{11,437}{2,300} = 4.97$

May 17	1,100	5.20	5,720					3,400	17,157	$\frac{17,157}{3,400} = 5.05$
May 25	800	5.25	4,200					4,200	21,357	$\frac{21,357}{4,200} = 5.09$
May 26					1,700	5.09	8,653	2,500	12,704	$\frac{12,704}{2,500} = 5.09$
May 31				Shortage	80			2,420	12,704	$\frac{12,704}{2,420} = 5.25$
June 11	900	5.40	4,860					3,320	17,564	$\frac{17,564}{3,320} = 5.29$
June 15					1,500	5.29	7,935	1,820	9,629	$\frac{9,629}{1,820} = 5.29$
June 21					1,200	5.29	6,348	620	3,281	$\frac{3,281}{620} = 5.29$
June 24	1,400	5.50	7,700					2,020	10,981	$\frac{10,981}{2,020} = 5.40$
June 30				Shortage	60			1,960	10,981	$\frac{10,981}{1,960} = 5.60$

3
Labour

Question 1

Distinguish between Idle Time and Idle Facilities. How are they treated in Cost Accounts? Develop a system of control for Idle Time in a factory.

Answer

Idle time: It refers to the labour time paid for but not utilised on production. Idle time thus represents the time for which wages are paid but no output is obtained. This is the period during which the workers remain idle. It arises due to various reasons. According to reasons, idle time can be classified into normal idle time and abnormal idle time. Normal idle time is the time which cannot be avoided or reduced in the normal course of business. For example, some labour time is bound to be lost due to the time taken by workers to cover the distance between the factory gate and the department or the actual work place where they are working. Some time also elapses between the finishing of one job and the starting of another job. Since a worker cannot work continuously for the whole day, sometime is required during which he attends to this personal needs, such as taking lunch or rest to avoid normal fatigue. It is thus obvious that normal idle time is unavoidable. Abnormal idle time may arise because of inefficiency, mischief and misfortune such as breakdown of machines for a long period, power failure, non-availability of materials, etc. generally, it is avoidable and controllable. However, abnormal idle time arising on account of strike, lockouts, floods, etc. may be uncontrollable. By proper care and caution abnormal idle time can be reduced or eliminated to a very great extent.

Idle facilities: The terms facilities has a wider connotation. It may include production capacity as well. Facilities may be provided by the fixed assets such as building space, plant/equipment capacity etc., or by various service functions such as material services, production services, personnel services etc., if a firm is not able to make full use of all these facilities then the firm may be said to have idle facilities. Thus, idle facilities refer to that part of total production facilities available which remain unutilized due to any reason such as non-availability of raw-material, etc. Idle facilities differ from idle time. A firm may have idle facilities even when it works full time; e.g., when facilities have been provided on too large a scale.

Treatment of idle time in Cost Accounting: Treatment of idle time in coast accounting depends upon its nature. The cost of normal idle time is charged to the cost of production. This may be done by inflating the labour rate or the normal idle time may be transferred to factory overhead for absorption through factory overhead absorption rate. In relative terms, the cost of normal idle time is generally nominal. As against normal idle time cost, the cost of abnormal idle time sometime may be quite substantial. Since these costs are beyond the control of the management and being abnormal in nature, they do not form part of cost of production. Therefore, payment for them is not included in cost of production and is transferred to costing profit and loss account.

Treatment of idle facilities in Cost Accounting: Normal idle facilities cost which arises due to unavoidable reasons, should be included in the works overhead. On the other hand, abnormal idle facilities cost which arises due to plants or machines/facilities remaining idle on account of trade depression or for want of work etc., should be written off to costing profit and loss account.

System of controlling idle time: The system of idle time control aims at controlling the time for which a worker has been paid but has not been utilised for productive purposes. Such a loss of time is know as idle time. The control of idle time requires the use of a proper system of recording the idle time, ascertaining its reasons for occurrence and initiating suitable administrative action to stop its reoccurrence.

To record the duration of idle time and to ascertain the reasons of its occurrence, the format given as below may be used. This format not only records the time paid for but also the standard time which a worker should take to produce a unit of output. The time actually paid on comparison with standard time may reveal the element of idle time, if any. After this the reasons for the occurrence of idle time should be ascertained and stated in the suitable column of the format. In this way a statement of labour time utilization is usually prepared. Such a statement is quite useful to the officers who are concerned with the control of idle time. In fact it serve as a sound basis for their actions to control idle time. Such a statement clearly points out to persons responsible for the control of idle time the reasons for the occurrence of idle time.

Finally, the concerned officer may suggest the remedial measures to minimize the occurrence of idle time in future.

Refer to the format on the next page.

Question 2

What do you understand by Labour Turnover? How is it measured? What are its causes? What are the remedial steps you would suggest to minimize its occurrence?

Labour Utilisation Statement

Department…….. Week Ending……

Standard Time							Causes						
Sl. No.	Category of Workers	Number of hours paid for	Output in Units	Time Per Unit of Output	Standard time for Output	Idle Time (3-6)	Break-down	Power Failure	Lack of Material	Lack of planning	Set up time	Ineffi-ciency	Etc.
1	2	3	4	5	6	7	8	9	10	11	12	13	14

Cost Accountant ……..……

Action taken ……..……..…… ……..……..……..…

……..……..……..…….. Department Supdt.

Answer

The process of workers leaving and coming in business organizations gives rise to the phenomenon of labour turnover. Labour turnover of an organization in the rate of change in its labour force during a specified period. This rate of change is compared with an index which acts as a thermometer to ascertain its reasonableness. The suitable index of labour turnover may be the standard or usual labour turnover in the industry or locality, or the labour turnover rate for a past period. A higher labour turnover reflects that the workers in the organization are new and inexperienced, and it is a matter of concern to the organization. Also it accounts for an increase in cost of production and even disturbs the even flow of production in the market.

Measurement of Labour Turnover: To measure labour turnover, the following three methods are available. Each method emphasizes on different aspects. But it is expected from business concerns that a particular method be used consistently to facilitate comparison of data from year to year. Labour turnover may be calculated by using any one of the following formulae:

$$\text{Labour turnover} = \frac{\text{Number of employees replaced}}{\text{Average number of employees on roll}} \times 100$$

$$= \frac{\text{Number of employees left}}{\text{Average number of employees on roll}} \times 100$$

$$= \frac{\text{Number joining plus number leaving}}{\text{Average number of employees on roll}} \times 100$$

Causes of Labour Turnover: The main causes of labour turnover in an organization/industry can be broadly classified under the following heads:

(a) Personal Causes

(b) Unavoidable Causes

(c) Avoidable Causes

Personal Causes are those which induce or compel workers to leave their jobs purely on personal grounds; e.g.

(i) Change of job for betterment.

(ii) Premature retirement due to ill health and old age.

(iii) Domestic problems and family responsibilities.

(iv) Discontentment over the job and working environment.

Unavoidable Causes are those under which it become obligatory on the part of management to ask some or more of their employees to leave the organization; such causes may include the following:

(i) Seasonal nature of business.

(ii) Shortage of raw material, power slack market for the products, etc.

(iii) Change in the plant location.

(iv) Disability, Making a worker unfit for work.

(v) Disciplinary measures.

Avoidable Causes are those causes which require the attention of management on a continuous basis so as to keep the labour turnover ratio as low as possible. The main causes are as follows:

(i) Dissatisfaction with job, remuneration, hours of work, working conditions etc.

(ii) Strained relationships with management, supervisors of fellow colleagues.

(iii) Lack of training facilities and promotional avenues.

(iv) Lack of recreational and medical facilities.

(v) Low wages and allowances.

Remedial steps to minimize labour turnover: The following remedial steps are useful in minimizing labour turnover.

1. *Exist interview:* An interview may be arranged with each outgoing employee, to ascertain the reasons of his leaving the organization.

2. *Job analysis and evaluation:* Before recruiting workers, job analysis and evaluation may be carried out to ascertain the requirements of each job.
3. *Scientific system of recruitment, selection, placement and promotion:* The organization should adopt the use of scientific system of recruitment, selection, placement and promotion of an employee within the organization.
4. *Enlightened attitude of management:* The management should introduce the following steps for creating a healthy working atmosphere.
   (i) Service rules should be framed, discussed and approved among management and workers, before their implementation.
   (ii) Provide facilities for education and training of workers.
   (iii) Introduce a procedure for settling workers grievance.
5. *Use of Committee:* Issues like control over workers, handling their grievances etc. may be dealt by a committee, comprising of members from management and workers.

Question 3

What do you understand by Overtime Premium?

What is the affect of overtime payment on productivity and cost?

Discuss the treatment of overtime premium in cost accounts and suggest a procedure for control of overtime work.

Answer

Overtime premium: Overtime is the amount of wages paid for working beyond normal working hours as specified by Factories Act or by a mutual agreement between the workers union and the management. According to Factories Act of 1948, a worker is entitled for overtime at double the rate of his wages (including allowances) if he works beyond 9 hours in a day or 48 hours in a week even where the Act is not applicable, the practice is to pay for overtime work at higher rates usually in accordance with a standing agreement between the employer and the workers. Hence, payment of overtime consists of two elements, the normal wages i.e., the usual amount, and the extra payment i.e., the premium. This amount of extra payment paid to a worker under overtime is known as overtime premium.

The overtime payment affects the productivity and cost in many ways as follows:

(i) During overtime period the efficiency of a worker is low. This causes reduced productivity, thus during this period the productivity is lesser than the normal one.

(ii) In their anxiety to earn more, the workers may not concentrate on work during normal time and thus the output during normal hours may also fall.

(iii) The practice of resorting to overtime adversely affects workers' health which may lead to increase in accident rate and consequently a decrease in productivity.

(iv) Due to overtime, it is not possible to carry out necessary maintenance of plants and machinery. Such a situation results occasionally in a major breakdown and hence accounts for the stoppage of production cycle.

(v) Reduced output and increased premium are responsible for bringing an increase in cost of production.

Overtime premium is a part of total wages of overtime period. In cost accounting the treatment of overtime premium will be as follows:

(i) If the overtime is resorted to at the desire of the customer, then the entire amount of overtime including overtime premium should be charged to the job directly.

(ii) If it is due to a general pressure of work to increase the output, the premium as well as overtime wages may be charged to general overheads.

(iii) If it is due to the negligence or delay of workers of a particular department, it may be charged to the concerned department.

(iv) If it is due to circumstances beyond control, it may be charged to Costing Profit & Loss Account.

As regards the control of overtimes is concerned, it is difficult to eliminate it completely. But it is not difficult to control it and to keep it to the barest minimum.

The procedure for control of overtime work involves the following steps:

1. Entire overtime work should be duly authorized after investigating the reasons for it.
2. Overtime cost should be shown against the concerned department. Such a practice should enable proper investigation and planning of production in future.
3. If overtime is a regular feature, the necessity for recruiting more men and adding a shift should be considered.
4. If overtime is due to lack of plant and machinery or other resources, steps may be taken to install more machines, or to resort to sub contracting.

Question 4

What are piece-rate? What advantage and disadvantages are attributed to their use? What principles should govern the determination and revision of piece-rates?

Answer

Piece Rate: It is that rate, which is paid to a worker for producing a single unit of output. The wages of a worker under piece rate method are calculated by multiplying the number of units of output produced by a pre-determined piece rate. For example, if the pre-determined piece rate is Rs. 5 per unit and a worker has produced 200 units, then the total wages to be paid will be Rs. 1,000.

To be more exact, the above type of piece rate method is known as straight piece rate. It has another variation also, which is known as differential piece rate. Under differential piece rate system, different piece rates are given to workers for different levels of efficiency.

Important advantage and disadvantages which are attributed to the use of piece rates are as follows:

Advantages of piece rates:

1. The application of piece rate acts as an incentive to workers to produce more to maximize their earnings.
2. Due to increase in output, the per unit total cost of production reduces.
3. Losses due to mishandling of machines and breakage of tools etc., are minimized, as the workers understand fully their importance.
4. Workers are constantly on the lookout to develop improved methods of performing jobs which may result in increased productivity.
5. The piece rate method is easily understood by workers and thus it is highly appreciated.
6. The use of piece rates reduces supervision costs.

Disadvantages of piece rates:

1. To maximize earnings, sometime sub standard quality of goods are produced by workers.
2. Workers hardly have any consideration for the resources of the concern. They may waste material and mishandle tools and machinery. Such an act on the part of workers reduces the concern's profitability.
3. The use of piece rate has no place for less efficient workers.
4. Due to continuous working for several hours, the health of workers is adversely affected.
5. The determination of a piece rate acceptable to workers is a difficult task. In fact, it is a disputable point between employees and employer.

Important principles of piece rate determination and revision :

Important principles which should govern the determination and revision of piece rates are as follows:

1. Different piece rates should be determined for different types of jobs.
2. The piece rates determination should give due consideration to factors such as requirement of jobs, conditions under which jobs would be performed, risk involved, efforts involved while working on the job, etc.
3. The wage rate should be such that it guarantees a minimum living wage to ensure a satisfactory standard of living.
4. It should reduce/stabilize labour turnover on its application.
5. It should act as an incentive to motivate workers in giving a higher output.
6. The wage rate should be able to reduce absenteeism and late coming.
7. It should be acceptable to trade unions.
8. It should be flexible and capable of being adapted to changed circumstances.

9. Piece rates should be revised as and when they are revised by other firms in the industry or there is an increase in the cost of living index.
10. It may be revised at the end of the contract period as settled between management and workers union.

Question 5

Define job evaluation and distinguish it from merit rating. Explain the methods and objectives of job evaluation.

Answer

Job evaluation can be defined as the process of analysis and assessment of jobs to ascertain reliably their relative worth and to provide management with a reasonably sound basis for determining the basic internal wage and salary structure for the various job positions. In other words, job evaluation provides a rationale for differential wages and salaries for different groups of employees and ensures that these differentials are consistent and equitable.

Merit rating is the quantitative or qualitative assessment of an employee's personality or his performance on the job made by his supervisor or other persons qualified to judge.

Points of distinction between job evaluation and merit rating: The main points of distinction between job evaluation and merit rating are as follows:

1. Job evaluation is the assessment of the relative worth of jobs within a company and merit rating is the assessment of the relative worth of the man behind a job. In other words, merit rating rates employees on their job while jobs evaluation rates the jobs.
2. Job evaluation and its accomplishments are meant to set up a rational wage and salary structure whereas merit rating provide a scientific basis for determining fair wages for each workers based on his ability and performance.
3. Job evaluation simplifies wage administration by bringing a uniformity in wage rates. On the other hand, merit rating is used to determine fair rate of pay for different workers on the basis of their performance.

Methods of job Evaluation: Methods of job evaluation can be classified into three major groups as below:

1. The Ranking and Grading Method.
2. The Point Rating Method.
3. The Factor Comparison Method.

1. *(i) The Ranking Method:* This method is simple, inexpensive and least formal of all job evaluation methods. This method is primarily concerned with the task of arranging various jobs in an enterprise in an order. The ordering of the jobs can be either from the lowest to the highest or the reverse.

The task of ranking each job is preceded by a careful job analysis and job description. The job analysis requires a careful enumeration of the requirements of each job whereas job description includes recording of the duties to be performed by workers on a job, their responsibilities, qualifications and conditions of work.

To rank various jobs, rates or experts are selected within the organization. They arrange each job on the basis of general over-all impressions, they have about each job. Sometimes the task of ranking jobs is performed by several individuals. These individuals work independently on the task and finally sit together to arrive at a unanimous ranking. This method is useful for small organizations with well defined jobs, but is not suitable for large enterprise with complex organizational structure. It can be easily understood and administrated because of its simplicity.

(ii) *Grading Method:* This methods is in fact a modification of the ranking method. Under this method a pre-determined number of grades or classes are established, on the basis of the knowledge about existing jobs in the organization, so that all jobs can be placed suitably under these graded classification. In other words, a hypothetical scale or yardstick of job values is determined and each job is compared with reference to this bench mark and graded or classified accordingly. Generally, a committee composed of persons in the organization, who have a clear picture of all jobs in the organization is entrusted with the task of evaluation.

The establishing of grade levels takes into account the complexities of the duties, requirement of technicians, labour and nature of supervisory responsibility involved in it. It also makes use of job description. Jobs requiring the carrying out of simple instructions and close supervision are graded at lowest level whereas higher grades are assigned to those jobs which require extensive use of skill and involves greater responsibility. After establishing grades, each job in the concern is screened with the purpose of assigning a suitable grade to it. All jobs within the same grade are treated alike, for the purpose of basic wage and salary.

The chief merit of this method is that it uses some logical basis for grading jobs and is widely used for salaried jobs. It is simple, inexpensive and tends to be more accurate than the ranking method.

2. *The Point Rating Method:* Under this method, initially key jobs are selected and studies. Each job is broken in terms of its job factors. (Job factors are the specific input elements required to be possessed/observed for the performance of different jobs by job holder). The list of job factors common to key jobs selected, may include factors like still, effort, responsibility, working conditions etc. selection of specific job factors is to be tailored to the requirements and peculiarities of particular organization and job. Different job factors are used to measure the worth of different jobs.

The next stage is to assign weights or points to each factor in a job. For example, the job factor, skill may be assigned 90 points while responsibility may carry a weightage of 60 points, in a particular job. Weightage can be increased along with the degree of particular job factors. For example, progressively higher points can be assigned to ascending degree of education-primary, secondary, college, and so on. The relative importance of

the various factors in a job is to be reflected in the weightage. Points or weightage for all the factors when totaled gives the evaluation of the job. The task of assigning weightage is usually performed by a committee of job evaluators.

Lastly, the point total differentials are translated into different base wage rates. For this purpose, it is necessary to have an idea of the prevailing wage rates on comparable jobs in the labour market in the industry on in the region. A wage survey may be necessary for the purpose. A wage trend line can be plotted on a scatter diagram whose coordinates represent (a) weightage (along x-axis) (b) rates paid (along y-axis), for each job.

The wage trend line approximates the prevailing wage rates for all jobs in the structure. Wage rates for all the other jobs can be interpolated by reading up from the point values to the wage line.

This method is less subjective in its approach and provides more consistency of results than any other method. But it is difficulty to develop. Also it is difficult to explain the concept used viz., of relative weights and points, relative points to money value etc., to employees.

3. *Factor Comparison Method:* To evaluate jobs a few key jobs selected and a limited set of key factors common to all these jobs are identified. The key jobs are ranked on each of the factors, one factor at a time, instead of being ranked as whole job. The wage rates on these jobs are determined in the same way as the point rating method. The wage rate is divided into the amounts being due for each of the key factors. A second ranking of jobs is done on the basis of the monetary values of each factor. These two ranks constitute the framework of the factor comparison system. All the other jobs are evaluated against the key jobs in terms of both factor points and monetary values of the factor, to arrive at the wage rates payable to those jobs.

   Objective of job evaluation: The objectives of job evaluation are explained as below:

   (a) To evolve a systematic job structure and wage and salary structure which mean the positioning of each job in relation to other jobs, as also the establishment of relationships among different classes of jobs in terms of their physical and monetary worth.

   (b) To simplify, stabilize and rationalize the wage, and salary grades or levels in the organization for purpose of administrative convenience and control. A neat and understandable wage and salary system is likely to improve the credibility of the organisation's intentions on employee remuneration.

   (c) To promote reliability, equity and fair-play in the design of wage structure. To match basic compensation with efforts, skills and hazards involved in each job so as to inject a sense of satisfaction among employees in different jobs as to the rational of differential wage/salary grades.

   (d) To ensure consistency between the organisation's wage and salary level and that of the industry or of other organizations in the geographical area in which the

organization is situated. A systematic job evaluation attempt is likely to result in a more or less uniform wage structure throughout an industry.

(e) To provide a basis to resolve controversies and conflicts on wage comparisons among different jobs. Many employees intuitively feel that their jobs involve more efforts, skills and responsibilities than the jobs of others in the organization. They also nurse grievances on the perceived inadequacy of basic compensation attached to their jobs compared to those of others. A rational job evaluation has the objective of removing or minimizing the subjective grievances of employees and workers on what their efforts and skills are worth.

(f) To remove gross anomalies and distortions in wage structure accumulated over the years through managerial sins of omission and commission. In some organizations jobs which do not call for much skill or effort or hazard may carry unduly high basic compensation. The reverse could also be prevalent-jobs which do place stringent and strenuous demands on the job holders do not carry commensurate compensation. Job evaluation at the minimum, is aimed at removing such indefensible anomalies.

Question 6

What do you understand by time and motion study? Explain how standard time is set under time study. State how time and motion study is useful to management.

Answer

Time study is defined as a work measurement technique for recording the time and rates of working for the elements of a specified job carried out under specified conditions, and for analyzing the data so as to obtain the time necessary for carrying out the job at a defined level of performance. Thus time study attempts to ascertain the time spent on each element of a job. The sum total of the time taken by all elements of a job is called the standard time. This standard time is the total time which should be taken by an average worker to perform a job under standard conditions.

Motion study involves a detailed study and analysis of the basic operations of a job or process with the object of eliminating unnecessary ones. Motion Study is closely associated with operations analysis. Operations analysis is a primary analysis which aims at eliminating major deficiencies. Motion Study is a secondary analysis which aims at refining the methods and operations to achieve further improvements and in addition it attempts to study the movements of human limbs as well as the mechanical set up and operations.

In brief, the time study aims at determining the standard time for a job and motion study aims at the elimination of unnecessary motions or the movements performed by the workers on the job. Time and motion study are infact complementary to each other.

The main steps involved in setting standard time for a job/operation under time study are as follows:

(i) Collect and record all the information available about the job, the operator and the surrounding conditions, which may affect the carrying out of the work.

(ii) Observe and record a complete description of the method and the operations necessary for performing the job. Further break down each of the operations performed for carrying out the job into its elements/parts.

(iii) Examine each operation and its elements thoroughly to ensure that the motions used to perform are most effective.

(iv) Measure and record by using a stop watch the time taken by different operators to perform each element of an operation. Enough such observations be taken to determine the average time of these observations. The average time is also known as normal or base time for each element. Sum the base time of each element to arrive at the base time of an operation.

(v) Determine the allowance for relaxation etc., to be made over and above the base time for the operation.

(vi) The standard time of an operation is obtained by adding the base time with the allowance made.

Time and Motion study is quite useful to management:

(a) It helps the management to assess correctly the labour requirements.

(b) It helps management in the fixation of wage rates and introduction of effective incentive schemes.

(c) It helps management in standardizing jobs, equipments and methods by giving guidance as to the best method of operating in the time set.

(d) It helps the management to improve on work methods by comparing time taken to complete the same type of work under different methods.

(e) It helps management in planning and exercising cost control.

Question 7

List down the factors to be considered before introducing a scheme of incentive to workers.

Answer

An incentive can be defined as the stimulation of effort and effectiveness on the part of workers by offering monetary inducement or enhanced facilities. It means that incentive can be given in monetary or non monetary form to workers. It is usually linked with the efforts made by individual workers or by their work group for increasing production. By the implementation of such a scheme not only the workers but also the employer is benefited. Due to increased production the overhead cost is spread over a larger output and thus per unit cost of production of the product is reduced.

Factors to be considered before introducing a scheme of incentives to workers.

1. The impact of the Scheme in motivating workers.
2. The impact of the scheme on workers performing:

(i) Quality job and thus giving a lower output

(ii) Routine job with a potential to give a higher output.

(iii) Job by using an automatic machine, where the possibility of increasing the output beyond the fixed number does not exist.

3. The reaction of workers and union leaders towards the incentive scheme.
4. How for it is practicable to measure the performance of each worker, as it is necessary for the calculation of incentive?
5. The extent of saving in cost of production per unit due to increased production.
6. The incentive schemes prevailing in other areas and industries or similar business.
7. The effect of incentive scheme on different sets of workers e.g., unskilled and skilled workers.
8. The exactitude with which standards of performance can be laid down. As it is necessary for the introduction of a scheme of incentives.
9. The cost of operating the scheme.
10. The capacity of the market to absorb the increased production because of the scheme without reducing the selling price.

Question 8

Distinguish between Casual worker and Outworker

(May, 1997, 4 marks)

Answer

Casual worker and outworker:

A worker who is appointed for a short duration to carry on normal business activities in place of a regular but temporarily absent worker. Such a worker is also know as daily wager or 'badlies'. A casual worker do not enjoy the facilities available to a regular worker.

A worker who do not work in the factory premises but either he works in his home or at a site outside the factory is know as an outworker. An outworker who works in a home is usually compensated on the basis of his output. He is supplied with raw materials and tools necessary for carrying out the job. An outworker (outside to factory) is usually engaged on specialized jobs/contract work.

Question 9

Discuss the three methods of calculating labour turnover (Nov., 2004, 3 marks)

Answer

Methods of Calculating labour turnover

(i) Replacement method $= \frac{\text{No. of employees replaced} \times 100}{\text{Av. number of employees on roll}}$

(ii) Separation method $= \frac{\text{No. of employees separated during the year}}{\text{Av. number of employees on the roll during the year}} \times 100$

(iii) Flex method $= \frac{(\text{No. of employees separated} + \text{No. of employees replaced})}{\text{Av. number of employees on roll during the period}} \times 100$

Question 10

Discuss the Gantt task and bonus system as a system of wage payment and incentives.

(Nov., 2004, 3 marks)

Answer

Gantt Task and Bonus System

This system is a combination of time and piecework system. According to this system a high standard or task is set and payment is made at time rate to a worker for production below the set standard.

Wages payable to workers under the plan are calculated as under:

Output	*Payment*
(i) Output below standard	Guaranteed time rate
(ii) Output at standard	Time rate plus bonus of 20% (usually) of time rate
(iii) Output over standard	High piece rate on worker's output. (It is so fixed so as to include a bonus of 20% of time rate)

Question 11

Discuss two types of Costs, which are associated with labour turnover

(Nov., 2003, 3 marks)

Answer

Two types of costs associated with labour turnover are:

(i) Preventive costs:

These costs are incurred to keep the labour turnover rate at a low level. They include costs of accommodation, transport facilities, medical services, welfare schemes, pension schemes, environment improvement, lighting, heating, air-conditioning etc. The rate of labour turnover is usually low, if a company incurs higher preventive costs.

(ii) Replacement costs:

These costs arise due to high labour turnover, e.g. cost of advertising, recruitment, selection, training & induction, abnormal breakage and scrap, extra wages & overheads etc., caused as a result of inefficient and inexperienced newly recruited workers.

Question 12

Discuss the accounting treatment of Idle time and overtime wages.

(May, 2003, 3 marks)

Answer

Accounting treatment of idle time wages & overtime wages in cost accounts:

Normal idle time is treated as a part of the cost of production. Thus, in the case of direct workers, an allowance for normal idle time is built into the labour cost rates. In the case of indirect workers, normal idle time is spread over all the products or jobs through the process of absorption of factory overheads.

Under Cost Accounting, the overtime premium is treated as follows:

- If overtime is resorted to at the desire of the customer, then the overtime premium may be charged to the job directly.
- If overtime is required to cope with general production programme or for meeting urgent orders, the overtime premium should be treated as overhead cost of particular department or cost center which works overtime.
- Overtime worked on account of abnormal conditions should be charged to costing Profit & Loss Account.
- If overtime is worked in a department due to the fault of another department the overtime premium should be charged to the latter department.

Question 13

Discuss the effect of overtime payment on productivity *(Nov., 2004, 3 marks)*

Answer

Effect of overtime payment on productivity: Overtime work should be resorted to only when it is extremely essential because it involves extra cost. The overtime payment increases the cost of production in the following ways:

1. The overtime premium paid is an extra payment in addition to the normal rate.

2. The efficiency of operators during overtime work may fall and thus output may be less than normal output.
3. In order to earn more the workers may not concentrate on work during normal time and thus the output during normal hours may also fall.
4. Reduced output and increased premium of overtime will bring about an increase cost of production.

Question 14

State the circumstances in which time rate system of wage payment can be preferred in a factory. (Nov., 2004, 3 marks)

Answer

Circumstances in which time rate system of wage payment can be preferred:

In the following circumstances the time rate system of wage payment is preferred in a factory.

1. Persons whose services cannot be directly or tangibly measured, e.g., general helpers, supervisory and clerical staff etc.
2. Workers engaged on highly skilled jobs or rendering skilled services, e.g., tool making, inspection and testing.
3. Where the pace of output is independent of the operator, e.g., automatic chemical plants.

Question 15

Discuss briefly, how will you deal with casual workers and workers employed on outdoor work in Cost Accounts. (May, 2002, 4 marks)

Answer

Causal and outdoor workers

Casual workers (badli workers) are employed temporarily, for a short duration to cope with sporadic increase in volume of work. If the permanent labour force is not sufficient to cope effectively with a rush of work, additional labour (casual workers) are employed to work for a short duration. Out door workers are those workers who do not carry out their work in the factory premises. Such workers either carry out the assigned work in their homes (e.g., knitwear, lamp shades) or at a site outside the factory.

Casual workers are engaged on a dally basis. Wages are paid to them either at the end of the day's work or after a periodic interval. Wages paid are charged as direct or indirect labour cost depending on their identifiability with specific jobs, work orders, or department.

Rigid control should be exercised over the out-workers specially with regard to following:

1. Reconciliation of materials drawn/issued from the store with the output.

2. Ensuring the completion of output during the stipulated time so as to meet comfortably the orders and contracts.

Question 16

It should be management's endeavor to increase inventory turnover but to reduce labour turnover. Expand and illustrate the idea contained in this statement.

Answer

Inventory turnover: It is a ratio of the value of materials consumed during a period to the average value of inventory held during the period. A high inventory turnover indicates fast movement of stock.

Labour turnover: It is defined as an index denoting change in the labour force for an organization during a specified period. Labour turnover in excess of normal rate is termed as high and below it as low turnover.

Effects of high inventory turnover and low labour turnover: High inventory turnover reduces the investment of funds in inventory and thus accounts for the effective use of the concern's financial resources. It also accounts for the increase of profitability of a business concern. As against high labour turnover the low labour turnover is preferred because high labour turnover causes-decrease in production targets; increase in the chances of break down of machines at the shopfloor level; increase in the number of accidents; loss of customers and their brand loyalty due to either non-supply of the finished goods or due to sub-standard production of finished goods; increase in the cost of selection, recruitment and training; increase in the material wastage and tools breakage.

All the above listed effects of high labour turnover accounts for the increase in the cost of production/process/service. This increase in the cost finally accounts for the reduction of concern's profitability. Thus, it is necessary to keep the labour turnover at a low level.

As such, it is correct that management should endeavour to increase inventory turnover and reduce labour turnover for optimum and best utilization of available resources and reduce the cost of production and thus increase the profitability of the organization.

Question 17

What is the impact of 'Labour Turnover' on a manufacturing organisation's working?

(Nov., 1998, 6 marks)

Answer

Labour turnover refers to the rate of change in the composition of labour force of a concern during a specified period of time. The impact of labour turnover on a manufacturing organisation's working is many fold.

In fact the labour turnover increases the cost of production in the following ways:

(i) Even flow of production is disturbed.

(ii) Cost of recruitment and training increases.

(iii) Breakage of tools, wastage of materials increases.

(iv) Overall production decreases due to the time lost between the leaving and recruitment of new workers.

(v) Reduction in sales accounts for loss of contribution and goodwill consequently.

Question 18

In a unit, 10 men work as a group. When the production for the group exceeds the standard output of 200 pieces per hour, each man is paid an incentive for the excess production in addition to his wages at hourly rates. The incentive is at half the percentage, the excess production over the standard bears to the standard production, Each man is paid an incentive at the rate of this percentage of a wage rate of Rs. 2 per hour. There is no relation between the individual workman's hourly rate and the bonus rate.

In a week, the hours worked are 500 hours and the total production is 1,20,000 pieces.

(a) Compute the total amount of the bonus for the week.

(b) *Calculate the total earnings of two workers A and B of the group:-*

A worked 44 hours and his basic rate per hour was Rs. 2.20.

B worked 48 hours and his basic rate per hour was Rs. 1.90.

Answer

Actual production during the week	1,20,000 pieces
Standard production during the week of 500 hours,	
@ 200 pieces per hour	1,00,000 pieces
Excess production over standard	20,000 pieces

Percentage of the excess production over the

Standard bears to the standard production $= \frac{20,000}{1,00,000} \times 100 = 20\%$

Incentive is half of 20% i.e. 10%.

The rate of incentive is at 10% over a wage rate of Rs. 2.00 per hour. Thus the rate of incentive per hour is 0.20P.

(a) Total amount of bonus for the week: 500 hours × Re. 0.20 = Rs. 100.

(b) *Total Earnings of two workers A & B of the group*.

	Amount
	Rs.
A's Wages for 44 hours @ Rs. 2.20 per hour	96.80
Bonus for 44 hours @ Re. 0.20 per hour	8.80
Total Earning of A	105.60
B's Wages for 48 hours @ Rs. 1.90 per hour	91.20
Bonus for 48 hours @ 0.20 per hour	9.60
Total Earning of B	100.80

Question 19

What are the main features of Halsey and Rowan method of payment of remuneration? State how Rowan Scheme is better than Halsey Scheme. Given time allowed of 30 hours for a job and the wage rate of Re. 1.00 per hour, illustrate your answer by assuming your own figure for time taken to do the job.

Answer

F.A. Halsey, an American Engineer, brought out his plan in 1891. the main features of his plan were as follows:

(ii) Time rate is guaranteed.

(iii) Standard time is fixed for the job or operation.

(iv) In case a worker completes the job or operation in less time than allowed time (or standard time) he is paid a fixed percentage of saving in time, which is usually 50%.

(v) Under this plan, the employer is benefited to the extent of remaining 50% of time saved.

(vi) Employer is not protected against overspeeding jobs by workers resulting in waste, damages etc.

Rowan Scheme was introduced by James Rowan in Glasgow in the year 1898. it is similar to Halsey Scheme but the premium concept here is different. The main features of Rowan Scheme are:

(i) Time rate is guaranteed.

(ii) Bonus is based on time saved.

(iii) Instead of fixed percentage of time saved, bonus is in proportion of time saved to time allowed.

(iv) Protects employer against loose rate setting.

(v) Employer shares the benefit of increased output.

The Rowan Scheme is better than Halsey Scheme because of the following reasons:

(i) In Halsey Scheme, bonus is set at 50% of time saved. It does not serve as a strong incentive. If workers overspeed, the quality of the products deteriorates.

(ii) In Rowan Scheme, there is an automatic check on the earnings and thus overspeeding is arrested. In Halsey Scheme if two third of the time is saved, the worker can double his earning per hour and in Rowan Scheme, this is not possible.

(iii) The earning per hour in Rowan Scheme is higher upto 50% of time saved and falls thereafter whereas in Halsey Scheme the earnings per hour increases at a slow speed and can be doubled.

Consider the following example in which the time allowed for performing the job is 30 hours and the wage rate is Re. 1.00 per hour. We will depict with the help of imaginary figures in the following example, how the earnings per hour under Halsey and Rowan plan will vary.

Example:

Time Allowed	*Time taken*	*Wage*	*Bonus*		*Total Wages*		*Earnings/hr*	
			Halsey	*Rowan*	*Halsey*	*Rowan*	*Halsey*	*Rowan*
			Rs.	*Rs.*	*Rs.*	*Rs.*	*Rs.*	*Rs.*
30	30	30	-	-	30.00	30.00	1.00	1.00
	20	20	5.00	6.67	25.00	26.67	1.25	1.33
	15	15	7.50	7.50	22.50	22.50	1.50	1.50
	10	10	10.00	6.67	20.00	16.67	2.00	1.67
	5	5	12.50	4.17	17.50	9.17	3.50	1.83

Question 20

Explain the meaning of and the reasons for Idle time and discuss its treatment in cost accounting. *(Nov, 2008, 3 marks)*

Answer

Idle time refers to the labour time paid for but not utilized on production. It, in fact, represents the time for which wages are paid, but during which no output is given out by the workers. This is the period during which workers remain idle.

Reasons for idle time: According to reasons, idle time can be classified into normal idle time and abnormal idle time. Normal idle time is the time which cannot be avoided or reduced in the normal course of business.

The main reasons for the occurrence of normal idle time are as follows:

1. Time taken by workers to travel the distance between the main gate of factory and the place of their work.
2. Time lost between the finish of one job and starting of next job.
3. Time spent to overcome fatigue.
4. Time spent to meet their personal needs like taking lunch, tea etc.

The main reasons for the occurrence of abnormal idle time are:

1. Due to machine break downs, power failure, non-availability of raw materials, tools or waiting for jobs due to defective planning.
2. Due to conscious management policy decision to stop work for some time.
3. In the case of seasonal goods producing units, it may not be possible for them to produce evenly throughout the year. Such a factor too results in the generation of abnormal idle time.

Treatment in Cost Accounting: Idle time may be normal or abnormal.

Normal idle time: It is inherent in any job situation and thus it cannot be eliminated or reduced. For example:- time gap between the finishing of one job and the starting of another; time lost due to fatigue etc.

The cost of normal idle time should be charged to the cost of production. This may be done by inflating the labour rate. It may be transferred to factory overheads for absorption, by adopting a factory overhead absorption rate.

Abnormal idle time: It is defined as the idle time which arises on account of abnormal causes; e.g. strikes; lockouts; floods; major breakdown of machinery; fire etc. Such an idle time is uncontrollable.

The cost of abnormal idle time due to any reason should be charged to Costing Profit & Loss Account.

Question 21

Discuss the objectives of time keeping & time booking.

Answer

Objectives of time keeping and time booking: Time keeping has the following two objectives:

(i) Preparation of Payroll: Wage bills are prepared by the payroll department on the basis of information provided by the time keeping department.

(ii) Computation of Cost: Labour cost of different jobs, departments or cost centers are computed by costing department on the basis of information provided by the time keeping department.

The objectives of time booking are as follows:

(i) To ascertain the labour time spent on the job and the idle labour hours.

(ii) To ascertain labour cost of various jobs and products.

(iii) To calculate the amount of wages and bonus payable under the wage incentive scheme.

(iv) To compute and determine overhead rates and absorption of overheads under the labour and machine hour method.

(v) To evaluate the performance of labour by comparing actual time booked with standard or budgeted time.

Question 22

Distinguish between Job Evaluation and Merit Rating.

Answer

Distinguish between Job Evaluation and Merit Rating

Job evaluation. It can be defined as the process of analysis and assessment of jobs to ascertain reliably their relative worth and to provide management with a reasonably sound basis for determining the basic internal wage and salary structure for the various job positions. In other words, job evaluation provides a rationale for differential wages and salaries for different groups of employees and ensures that these differentials are consistent and equitable.

Merit Rating. It is a systematic evaluation of the personality and performance of each employee by his supervisor or some other qualified persons.

Thus the main points of distinction between job evaluation and merit rating are as follows:

1. Job evaluation is the assessment of the relative worth of jobs within a company and merit rating is the assessment of the relative worth of the man behind a job. In other words job evaluation rate the jobs while merit rating rate employees on their jobs.
2. Job evaluation and its accomplishment are means to set up a rational wage and salary structure whereas merit rating provides scientific basis for determining fair wages for each worker based on his ability and performance.
3. Job evaluation simplifies wage administration by bringing a uniformity in wage rates. On the other hand merit rating is used to determine fair rate of pay for different workers on the basis of their performance.

Question 23

Calculate the earnings of A and B from the following particulars for a month and allocate the labour cost to each job X, Y and Z:

		A	*B*
(i)	*Basic Wages*	*Rs. 100*	*160*
(ii)	*Dearness Allowance*	*50%*	*50%*
(iii)	*Contribution to Provident Fund (on basic wages)*	*8%*	*8%*
(iv)	*Contribution to Employees' State Insurance (on basic wages)*	*2%*	*2%*
(v)	*Overtime*	*Hours 10*	

The Normal working hours for the month are 200. Overtime is paid at double the total of normal wages and dearness allowance. Employer's contribution to State Insurance and

Provident Fund are at equal rates and employees' contributions. The two workers were employed on jobs X, Y and Z in the following proportions:

	Jobs		
	X	*Y*	*Z*
Workers A	*40%*	*30%*	*30%*
Worker B	*50%*	*20%*	*30%*

Overtime was done on job Y.

Answer

Statement Showing Earnings of Workers A and B

Workers:	*A*	*B*
	Rs.	*Rs.*
Basic Wages	100	160
Dearness Allowance *(50% of Basic Wages)*	50	50
Overtime Wages *(Refer to Working Note 1)*	15	-
Gross Wages earned	165	240
Less: - Provident Fund – 8% of Basic wages		
- ESI – 2% of Basic wage	10	16
Net Wages paid	155	224

Statement of Labour Cost:	*Rs.*	*Rs.*
Gross Wages *(excluding overtime)*	150	240
Employer's Contribution to P.F. and E.S.I.	10	16
Ordinary wages	160	256
Labour Rate per hour	0.80	1.28
	(Rs. 160/200)	*(Rs. 256/200)*

Statement Showing allocation of Wages to Jobs

		Jobs		
Total Wages:		*X*	*Y*	*Z*
	Rs.	*Rs.*	*Rs.*	*Rs.*
Worker A:				
Ordinary Wages:	160	64	48	48

(4 : 3 :3)				
Overtime	15	–	15	–
Workers B:				
Ordinary Wages:	256	128	51.20	76.8
(5: 2 : 3)				
	431	192	114.2	124.8

Working Notes:

1. Normal Wages are considered as basic wages

$$\text{Overtime} = \frac{2 \times (\text{Basic wage} + \text{D.A.})}{200} \times 10 \text{ hours}$$

= 2 × (Rs. 150/200) × 10 hours = Rs. 15/-.

Question 24

Wage negotiations are going on with the recognized Labour Union and the Management wants you as the Cost Accountant of the Company to formulate an incentive scheme with a view to increase productivity.

The case of three typical workers Achyuta, Ananta and Govinda who produce respectively 180, 120 and 100 units of the company's product in a normal day of 8 hours is taken up for study.

Assuming that day wages would be guaranteed at 75 paise per hour and the piece rate would be based on a standard hourly output of 10 units calculate the earnings of each of the three workers and the labour cost per 100 pieces under (i) Day wages, (ii) Piece rate, (iii) Halsey, scheme and (iv) The Rowan scheme.

Also calculate under the above schemes the average cost of labour for the company to produce 100 pieces.

Answer

Calculation of earnings of each of

the three workers and the labour cost per 100 piece under different wage schemes

(i) Day wages

Name of workers	*Day wages*	*Actual output (units)*	*Labour cost per 100 pieces*
	Rs.		*Rs.*
Achyuta	6.00	180	3.33
Ananta	6.00	120	5.00
Govinda	6.00	100	6.00
Total	18.00	400	

Average Cost of Labour for the Company to produce 100 pieces

$$= \frac{\text{Total wages paid}}{\text{Total output}} \times 100 = \frac{\text{Rs.18}}{400} \times 100 = \text{Rs.4.50}$$

(ii) Piece rate

Name of workers	*Actual Output (units)*	*Piece rate Rs.*	*Wages earned Rs.*	*Labour cost per 100 pieces Rs.*
Achyuta	180	0.075	13.50	7.50
Ananta	120	0.075	9.00	7.50
Govinda	100	0.075	7.50	7.50
Total	400		30.00	

$$\text{Average Cost of Labour for the Company to produce 100 pieces} = \frac{\text{Rs.30}}{400} \times 100 = \text{Rs.7.50}$$

(iii) Halsey Scheme

Name of Workers	*Actual output (units)*	*Std. Time for actual output Hrs.*	*Actual time for actual Output Hrs.*	*Time saved Hrs.*	*Bonus Hrs. (50% of time saved) Hrs.*	*Total Wages inclu-ding Bonus* Rs.*	*Labour cost per 100 pieces Rs.*
Achyuta	180	18	8	10	5	9.75	5.42
Ananta	120	12	8	4	2	7.50	6.25
Govinda	100	10	8	2	1	6.75	6.75
						24.00	

Average cost of labour for the

Company to produce 100 pieces = (Rs. 24/400) × 100 = Rs. 6.00

*Total wages = (Actual hours worked + Bouus hours) Rate per hour

Hence total wages of Achyuta are : (8 + 5) Rs. 0.75 = Rs. 9.75

Similarly, the total wages of Ananta and Govinda are Rs. 7.50 and Rs. 6.75 respectively.

(iv) Rowan Scheme

Name of workers	*Actual output (units)*	*Std. Time for actual output (hours)*	*Actual time taken in hours*	*Time saved (hours)*	*Bonus* hours*	*Wages for actual hrs. @ 0.75 P. per hour*	*Bonus @ 0.75 per Bonus hour*	*Total earning*	*Labour cost per 100 pieces*
						Rs.	*Rs.*	*Rs.*	*Rs.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	7+8=(9)	(10)
Achyuta	180	18	8	10	4.44	6.00	3.33	9.33	5.18
Ananta	120	12	8	4	2.67	6.00	2.00	8.00	6.67
Govinda	100	10	8	2	1.6	6.00	1.20	7.20	7.20
								24.53	

Average Cost of labour to the Company for 100 pieces = $\frac{\text{Rs.}24.53}{400} \times 100 = \text{Rs.}6.13$

* $\text{Bonus hours} = \text{Time taken} \times \frac{\text{Time saved}}{\text{Standard time}}$

$\text{Bonus hours of Achyuta} = \frac{8\text{ hours} \times 10\text{ hours}}{18\text{ hours}} = 4.44$

Similarly, bonus hours of Ananta and Govinda are 2.67 hours and 1.6 hours respectively.

Question 25

(a) Bonus paid under the Halsey Plan with Bonus at 50% for the time saved equals the bonus paid under the Rowan System. When will this statement hold good? (Your answer should contain the proof).

(b) The time allowed for a job is 8 hours. The hourly rate is Rs. 8. Prepare a statement showing:

(i) The bonus earned

(ii) The total earnings of labour and

(iii) Hourly earnings.

Under the Halsey System with 50% bonus for time saved and Rowan System for each hour saved progressively.

Answer

(a) Bonus under Halsey Plan

= Standard wage rate $\times \frac{50}{100} \times$ Time saved ..... (i)

Bonus under Rowan Plan

$$= \text{Standard wage rate} \times \frac{\text{Time saved}}{\text{Time allowed}} \times \text{Time taken} \quad \ldots\ldots\ldots \text{(ii)}$$

Bonus under Halsey Plan will be equal to the

Bonus under Rowan Plan when the following condition holds good

$$\text{Standard wage rate} \times \frac{50}{100} \times \text{Time saved}$$

$$= \text{Standard wage rate} \times \frac{\text{Time saved}}{\text{Time allowed}} \times \text{Time taken}$$

$$\text{or} \quad \frac{1}{2} = \frac{\text{Time taken}}{\text{Time allowed}}$$

$$\text{or Time taken} = \frac{1}{2} \text{ of Time allowed}$$

Hence, when the time taken is 50% of the time allowed the bonus under Halsey and Rowan Plans is equal.

(b) Statement of Bonus, Total earnings of Labour and hourly earnings under Halsey and Rowan Systems

Time allowed	*Time taken*	*Time saved*	*Basic Wages* $B \times$ Rs. 8	*Bonus under Halsey system* $C \times \frac{50}{100}$ Rs.8	*Bonus under Rowan System* $\frac{C}{A} \times B$ Rs.8	*Total earnings under Halsey System* D+E	*Total earnings under Rowan System* D+F	*Hourly earnings under Halsey System* G/B	*Hourly earnings under Rowan System* H/B
hours	*B hours*	*C=(A-B) hours*	*D* Rs.	*E* Rs.	*F* Rs.	*G* Rs.	*H* Rs.	*I* Rs.	*J* Rs.
8	8	-	64	-	-	64	64	8.00	8.00
8	7	1	56	4	7	60	63	8.57	9.00
8	6	2	48	8	12	56	60	9.33	10.00
8	5	3	40	12	15	52	55	10.40	11.00
8	4	4	32	16	16	48	48	12.00	12.00
8	3	5	24	20	15	44	39	14.67	13.00
8	2	6	16	24	12	40	28	20.00	14.00
8	1	7	8	28	7	36	15	36.00	15.00

Question 26

Mr. A is working by employing 10 skilled workers. He is considering the introduction of some incentive scheme – either Halsey Scheme (with 50% bonus) or Rowan Scheme – of wage payment for increasing the labour productivity to cope with the increased demand for the product by 25%. He feels that if the proposed incentive scheme could bring about an average 20% increase over the present earnings of the workers, it could act as sufficient incentive for them to produce more and he has accordingly given this assurance to the workers.

As a result of the assurance, the increase in productivity has been observed as revealed by the following figures for the current month:

Hourly rate of wages (guaranteed)	*Rs. 2.00*
Average time for producing 1 piece by one workers at the previous performance (This may be taken as time allowed)	*2 hours*
No. of working days in the month	*25*
No. of working hours per day for each worker	*8*
Actual production during the month	*1,250 units*

Required:

1. *Calculate effective rate of earnings per hour under Halsey Scheme and Rowan Scheme.*
2. *Calculate the savings to Mr. A in terms of direct labour cost per piece under the schemes.*
3. *Advise Mr. A about the selection of the scheme to fulfill his assurance.*

Answer

Working Notes:

1. Total time wages of 10 workers per month:

= No. of working days in the month × No. of working hours per day of each worker × Hourly rate of wages × No. of workers	Rs. 4,000
= 25 days × 8 hrs. × Rs. 2 × 10 workers	

2. Time saved per month:

Time allowed per piece by a worker	2 hours
No. of units produced during the month by 10 workers	1,250 pieces
Total time allowed to produce 1,250 pieces:	
(1,250 ×2 hours)	2,500 hours
Actual time taken to produce 1,250 pieces:	2,000 hours
Time saved (2,500 hours – 2,000 hours)	500 hours

3. Bonus under Halsey scheme to be paid to 10 workers:

Bonus = (50% of time saved) × hourly rate of wages

$$= \frac{50}{100} \times 500 \text{ hours} \times Rs.2 = Rs.500$$

Total wages to be paid to 10 workers are (Rs. 4,000 + Rs. 500) Rs. 4,500, if Mr. A considers the introduction of Halsey Incentive Scheme to increase the labour productivity.

3. Bonus under Rowan Scheme to be paid to 10 workers:

$$\text{Bonus} = \frac{\text{Time saved}}{\text{Total time allowed}} \times \text{Time wages}$$

$$= \frac{500 \text{ hours}}{2{,}500 \text{ hours}} \times Rs.4{,}000 = Rs.800$$

Total wages to be paid to 10 workers are (Rs. 4,000 + Rs. 800) Rs. 4,800, if Mr. A considers the introduction of Rowan Incentive Scheme to increase the labour productivity.

1. (i) Effective hourly rate of earnings under Halsey scheme:

(Refer to Working Notes 1, 2 and 3)

$$= \frac{\text{Total time wages of 10 workers} + \text{Total bonus under Halsey scheme}}{\text{Total hours worked}}$$

$$= \frac{Rs.4{,}000 + Rs.500}{2{,}000 \text{ hours}} = Rs.2.25$$

(ii) Effective hourly rate of earnings under Rowan scheme:

(Refer to Working Notes 1, 2 and 4)

$$= \frac{\text{Total time wages of 10 workers} + \text{Total honus under Rowan scheme}}{\text{Total hours worked}}$$

$$= \frac{Rs.4{,}000 + Rs.800}{2{,}000 \text{ hours}} = Rs.2.40$$

2. (i) Saving in terms of direct labour cost per piece under Halsey scheme:

(Refer to Working Note 3)

Labour cost per piece (under time wage scheme) = 2 hours × Rs. 2 = Rs. 4

Labour cost per piece (under Halsey scheme)

$$= \frac{\text{Total wages paid under the scheme}}{\text{Total number of units produced}}$$

$$= \frac{\text{Rs. } 4{,}500}{1{,}250} = \text{Rs.}3.60$$

Saving per piece : (Rs. 4– Rs. 3.60) = Rs. 0.40.

(ii) Saving in terms of direct labour cost per piece under Rowan scheme:

(Refer to Working Note 4)

Labour cost per piece under Rowan scheme $= \frac{\text{Rs.}4{,}800}{1{,}250} = \text{Rs. } 3.84$

Saving per piece = Rs. 4– Rs. 3.84 = Rs. 0.16.

3. From the labour cost per piece under Halsey scheme (Rs. 3.60) and Rowan scheme (Rs. 3.84), it is quite clear that Halsey scheme brings about more saving than Rowan scheme to the concern. But Halsey scheme does not fulfils the assurance given to the workers about 20% increase in their earnings as it secures only 12.5% $\left[\frac{500}{4{,}000} \times 100\right]$ increase. On the other hand, Rowan scheme secures 20% $\left[\frac{800}{4{,}000} \times 100\right]$ increase in the earnings and it fulfils the assurance. Therefore, Rowan scheme may be adopted.

Question 27

A factory having the latest sophisticated machines wants to introduce an incentive scheme for its workers, keeping in view the following:

(i) The entire gains of improved production should not go to the workers.

(ii) In the name of speed, quality should not suffer.

(iii) The rate setting department being newly established are liable to commit mistakes.

You are required to devise a suitable incentive scheme and demonstrate by an illustrative numerical example how your scheme answers to all the requirements of the management.

Answer

Rowan scheme of premium bonus (variable sharing plan) is a suitable incentive scheme for the workers of the factory. If this scheme is adopted, the entire gains due to time saved by a worker will not pass to him.

Another feature of this scheme is that a worker cannot increase his earnings or bonus by merely increasing its work speed. The reason for this is that the bonus under Rowan Scheme is maximum when the time taken by a worker on a job is half of the time allowed. As this fact is known to the workers, therefore they work at such a speed which helps them to maintain the quality of output too.

Lastly, Rowan System provides a safeguard in case of any loose fixation of the standards by the rate setting department. It may be observed from the following illustration that in the Rowan Scheme the bonus paid will be low due to any loose fixation of standards. Workers

cannot take undue advantage of such a situation. The above three features of Rowan Plan can be discussed with the help of the following illustration:

Illustration

(i) Time allowed = 4 hours

Time taken = 3 hours

Time Saved = 1 hour

Rate = Rs. 5 per hour.

$$\text{Bonus} = \frac{\text{Time taken}}{\text{Time allowed}} \times \text{Time saved} \times \text{Rate}$$

$$= \frac{3 \text{ hours}}{4 \text{ hours}} \times 1 \text{ hour} \times \text{Rs. } 5 = \text{Rs. } 3.75$$

In the above illustration time saved is 1 hour and therefore total gain is Rs. 5. Out of Rs. 5/- according to Rowan Plain only Rs. 3.75 is given to the worker in the form of bonus. In other words a worker is entitled for 75 percent of the time saved in the form of bonus.

(ii) The figures of bonus in the above illustration when the time taken is 2 hours and 1 hours respectively are as below:

$$\text{Bonus} = \frac{\text{Time taken}}{\text{Time allowed}} \times \text{Time saved} \times \text{Rate}$$

$$= \frac{2 \text{ hours}}{4 \text{ hours}} \times 2 \text{ hours} \times \text{Rs. } 5 = \text{Rs. } 5$$

$$\text{Bonus} = \frac{1 \text{ hour}}{4 \text{ hours}} \times 3 \text{ hours} \times \text{Rs. } 5 = \text{Rs. } 3.75$$

The above figures of bonus clearly shows that when time taken is half of the time allowed, the bonus is maximum. When the time is reduced from 2 to 4 hours, the bonus figures fell by Rs.1.25. Hence, it is quite apparent to workers that it is of no use to increase speed of work. This features of Rowan Plan thus protects the quality of output.

(iii) If the rate setting department erroneously sets the time allowed as 10 hours instead of 4 hours, in the above illustration, then the bonus paid will be as follows:

$$\text{Bonus} = \frac{3 \text{ hours}}{10 \text{ hours}} \times 7 \text{ hours} \times \text{Rs. } 5 = \text{Rs. } 10.5$$

The bonus paid for saving 7 hours thus is Rs. 10.50 which is approximately equal to the wages of 2 hours. In other words the bonus paid to the workers is low. Hence workers cannot take undue advantage of any mistake committed by the rate setting department of the concern.

Question 28

The cost accountant of Y Ltd. has computed labour turnover rates for the quarter ended 31st March, 1997 as 10%, 5% and 3% respectively under Flux method, 'Replacement method' and 'Separation method'. If the number of workers replaced during that quarter is 30, find out the number of (1) workers recruited and joined and (2) workers left and discharged.

(May, 1997, 6 marks)

Answer

Working Note:

Average number of workers on roll:

$$\text{Labour turnover rate } \textit{(under Replacement method)} = \frac{\text{No. of replacements}}{\text{Average number of workers on roll}} \times 100$$

$$\text{Or} = \frac{5}{10} = \frac{30}{\text{Average number of workers on roll}}$$

$$\text{Average number of workers on roll} = \frac{30 \times 100}{5} = 600$$

(1) Number of workers recruited and joined:

$$\text{Labour turnover rate } \textit{(Flux method)} = \frac{\text{No. of separations (S)} + \text{No. of accessions (A)}}{\text{Av. number of workers on roll}} \times 100$$

(Refer to Working Note)

$$\text{Or } \frac{10}{100} = \frac{18 + A}{600}$$

$$\text{Or } A = \left[\frac{6000}{100} - 18\right] = 42$$

No. of workers recruited and joined 42.

(2) Number of workers left and discharged:

$$\text{Labour turnover rate } \textit{(Separation method)} = \frac{\text{No. of separations (S)}}{\text{Av. number of workers on roll}} \times 100$$

(Refer to working note)

$$\frac{3}{100} = \frac{S}{600}$$

$$\text{Or } S = 18$$

Hence, number of workers left and discharged comes to 18.

Question 29

Distinguish between Job Evaluation and Merit Rating.

(Nov., 1999, 4 marks)

Answer

Distinguish between Job Evaluation and Merit Rating

Job evaluation: It can be defined as the process of analysis and assessment of jobs to ascertain reliably their relative worth and to provide management with a reasonably sound basis for determining the basic internal wage and salary structure for the various job positions. In other words, job evaluation provides a rationale for differential wages and salaries for different groups of employees and ensures that these differentials are consistent and equitable.

Merit rating: It is a systematic evaluation of the personality and performance of each employee by his supervisor or some other qualified person.

The main points of distinction between job evaluation and merit rating are as follows:

1. Job evaluation is the assessment of the relative worth of jobs within a company and merit rating is the assessment of the relative worth of the man behind a job. In other words, job evaluation rate the jobs while merit rating rate employees on these jobs.
2. Job evaluation and its accomplishment are means to set up a rational wage and salary structure whereas merit rating provides scientific basis for determining fair wages for each worker based on his ability and performance.
3. Job evaluation simplifies wage administration by bringing a uniformity in wage rates. On the other hand, merit rating is used to determine fair rate of pay for different workers on the basis of their performance.

Question 30

What do you mean by time and motions study? Why is it so important to management?

Answer

Time and motions study: It is the study of time taken and motions (movements) performed by workers while performing their jobs at the place of their work. Time and motion study has played a significant role in controlling and reducing labour cost.

Time Study is concerned with the determination of standard time required by a person of average ability to perform a job. Motion study, on the other hand, is concerned with determining the proper method of performing a job so that there are no wasteful movements, hiring the worker unnecessarily. However, both the studies are conducted simultaneously. Since materials, tools, equipment and general arrangement of work, all have vital bearing on the method and time required for its completion. Therefore, their study would be incomplete and would not yield its full benefit without a proper consideration of these factors.

Time and motion study is important to management because of the following features:

1. Improved methods, layout, and design of work ensures effective use of men, material and resources.
2. Unnecessary and wasteful methods are pin-pointed with a view to either improving them or eliminating them altogether. This leads to reduction in the work content of an operation, economy in human efforts and reduction of fatigue.
3. Highest possible level of efficiency is achieved in all respect.
4. Provides information for setting labour standards - a step towards labour cost control and cost reduction.
5. Useful for fixing wage rates and introducing effective incentive scheme.

Question 31

What is overtime premium? Explain the treatment of overtime premium in cost accounting. Suggest steps for controlling overtime. (Nov., 1995, 8 marks)

Answer

Overtime premium: Overtime is the amount of wages paid for working beyond normal working hours as specified by Factories Act or by a mutual agreement between the workers union and the management. According to Factories Act of 1948, a worker is entitled for overtime at double the rate of his wages (including allowances) if he works beyond 9 hours in a day or 48 hours in a week, even where the Act is not applicable, the practice is to pay for overtime work at higher rates usually in accordance with a standing agreement between the employer and the workers. Hence, payment of overtime consists of two elements, the normal wages e.g., the usual amount, and the extra payment i.e., the premium. This amount of extra payment paid to a worker under overtime is known as overtime premium.

Treatment of Overtime premium is Cost Accounting

In cost accounting the treatment of overtime premium will be as follows:

(i) If the overtime is resorted to at the desire of the customer, then the entire amount of overtime including overtime premium should be charged to the job directly.

(ii) If it is due to a general pressure of work to increase the output, the premium as well as overtime wages may be charged to general overheads.

(iii) If it is due to the negligence or delay of workers of a particular department, it may be charged to the concerned department.

(iv) If it is due to circumstances beyond control, it may be charged to Costing Profit & Loss Account.

Steps for Controlling Overtime:

Important steps for controlling overtime work are as follows:

(i) Entire overtime work should be duly authorized after investigating the reasons for it.

(ii) Overtime cost should be shown against the concerned department. Such a practice should enable proper investigation and planning of production in future.

(iii) If overtime is a regular feature, the necessity for recruiting more men and adding a shift should be considered.

(iv) If overtime is due to lack of plant and machinery or other resources, steps may be taken to install more machines, or to resort to sub-contracting.

(v) If possible an upper limit may be fixed for each category of workers in respect of overtime.

Question 32

Distinguish between Job Evaluation and Merit Rating (Nov., 1996, 4 marks)

Answer

Job evaluation and merit rating:

The main points of distinction between job evaluation and merit rating are as follows:

1. Job evaluation is the ascertainment of the relative worth of jobs within a company and merit rating is the assessment of the relative worth of the man behind a job. In other words, merit rating rates employees on their job while job evaluation rates the jobs.
2. Job evaluation and its accomplishments are meant to set up a rational wage and salary structure whereas merit rating provides a scientific basis for determining fair wages for each worker based on his ability and performance.
3. Job evaluation simplifies wage administration by brining a uniformity in wage rates. On the other hand, merit rating is used to determine fair rate of pay for different workers on the basis of their performance.

Question 33

Discuss the treatment of overtime premium in Cost accounting. (Nov. 2004, 3 marks)

Answer

Treatment of Overtime Premium in Cost Accounting

- If overtime is resorted to at the desire of the customer, then overtime premium may be charged to the job directly.
- If overtime is required to cope with general production programme or for meeting urgent orders, the overtime premium should be treated as overhead cost of the particular department or cost center, which works overtime.
- If overtime is worked in a department, due to the fault of another department, the overtime premium should be charged to the latter department.
- Overtime worked on account of abnormal conditions such as flood, earthquake etc., should not be charged to cost but to costing P/L A/c.

Question 34

ZED Limited is working by employing 50 skilled workers it is considered the introduction of incentive scheme-either Halsey scheme (with 50% bonus) or Rowan scheme of wage payment for increasing the labour productivity to cope up the increasing demand for the product by 40%. It is believed that proposed incentive scheme could bring about an average 20% increase over the present earnings of the workers; it could act as sufficient incentive for them to produce more.

Because of assurance, the increase in productivity has been observed as revealed by the figures for the month of April, 2004.

Hourly rate of wages (guaranteed)	*Rs. 30*
Average time for producing one unit by one worker at the previous	*1.975 hours*
Performance (This may be taken as time allowed)	
Number of working days in the month	*24*
Number of working hours per day of each worker	*8*
Actual production during the month	*6,120 units*

Required:

(i) *Calculate the effective rate of earnings under the Halsey scheme and the Rowan scheme.*

(ii) *Calculate the savings to the ZED Limited in terms of direct labour cost per piece.*

(iii) *Advise ZED Limited about the selection of the scheme to fulfill their assurance.*

(May, 2004, 8 marks)

Answer

Working notes:

1. Computation of time saved (in hours) per month:

= (Standard production time of 6,120 units – Actual time taken by the workers)

= (6,120 units × 1.975 hours – 24 days × 8 hrs per day × 50 skilled workers)

= (12,087 hours – 9,600 hours)

= 2,487 hours

2. Computation of bonus for time saved hours under Halsey and Rowan schemes:

Time saved hours	=	2,487 hours
(Refer to working note 1)		
Wage rate per hour	=	Rs. 30
Bonus under Halsey Scheme	=	½ × 2,487 hours × Rs. 30
(With 50% bonus)	=	Rs. 37,305

Bonus under Rowan Scheme = $\frac{\text{Time saved}}{\text{Time allowed}}$ × Time taken × Rate per hour

= $\frac{2{,}487 \text{ hours}}{12{,}087}$ × 9,600 hours × Rs.30

= Rs. 59,258.38 P.

(i) Computation of effective rate of earnings under the Halsey and Rowan schemes:

Total earnings (under Halsey scheme) = Time wages + Bonus

(Refer to working note 2)

= 24 days × 8 hours + 50 skilled workers × Rs. 30+ Rs. 37,305

= Rs. 2,88,000 + Rs. 37,305 = Rs. 3,25,305

Total earnings (under Rowan scheme) = Time wages + Bonus

(Refer to working note 2)

= Rs. 2,88,000 + Rs. 59,258.38

= Rs. 3,47,258.38

Effective rate of earnings per hour (under Halsey Plan = Rs. 33.89

(Rs. 3,25,305/9,600 hrs)

Effective rate of earnings per hour (under Rowan Plan = Rs. 36.17

(Rs. 3,47,258.38/9,600 hrs)

(ii) Savings to the ZED Ltd., in terms of direct labour cost per piece:

	Rs.
Direct labour cost (per unit) under time wages system *(1,975 time per unit × Rs. 30)*	59.25
Direct labour cost (per unit) under Halsey Plan *(Rs. 3,25,305 / 6,120 units)*	53.15
Direct labour cost (per unit) under Rowan Plan *(Rs. 3,47,258.38/6,120 units)*	56.74
Saving of direct labour cost under:	
* Halsey Plan *(Rs. 59.25 – 53.15)*	Rs. 6.10
* Rowan Plan *(Rs. 59.25-56.74)*	Rs. 2.51

(iv) Advise to ZED Ltd: *(about the selection of the scheme to fulfill assurance)*

Halsey scheme brings more savings to the management of ZED Ltd., over the present earnings of Rs. 2,88,000 but the other scheme viz Rowan fulfils the promise of 20% increase over the present earnings of Rs. 2,88,000 by paying 20.58% in the form of bonus. Hence Rowan Plan may be adopted.

Question 35

A Company is undecided as to what kind of wage scheme should be introduced. The following particulars have been compiled in respect of three systems, which are under consideration of the management.

		Workers	
Actual hours worked in a week	*38*	*40*	*34*
Hourly rate of wages	*Rs. 6*	*Rs. 5*	*Rs. 7.20*
Production in units			
Product P	*21*	*-*	*60*
Product Q	*36*	*-*	*135*
Product R	*46*	*25*	*-*

Standard time allowed per unit of each product is:

	P	*Q*	*R*
Minutes	*12*	*18*	*30*

For the purpose of piece rate, each minute is valued at Rs. 0.10

You are required to calculate the wages of each worker under:

(i) Guaranteed hourly rates basis

(ii) Piece work earnings basis, but guaranteed at 75% of basic pay (guaranteed hourly rate) if his earnings are less than 50% of basic pay.

(iii) *Premium bonus basis where the worker receives bonus based on Rowan scheme.*

(Nov., 2002, 9 marks)

Answer

(i) Computation of wages of each worker under guaranteed hourly rate basis

Workers	*Actual hours worked in a week*	*Hourly rate of wages Rs.*	*Wages Rs.*
(a)	*(b)*	*(c)*	*(d) = (b) × (c)*
A	38	6.00	228.00
B	40	5.00	200.00
C	34	7.20	244.80

(ii) Computation of wages of each worker under piece work earnings basis

		Worker A		*Worker B*		*Worker C*	
Product	*Piece rate per unit (Refer to working note 1)*	*Units*	*Wages Rs.*	*Units*	*Wages Rs.*	*Units*	*Wages Rs.*
(a)	*(b)*	*(c)*	*(d) = (b) × (c)*	*(e)*	*(f) = (b) × (e)*	*(g)*	*(h) = (b) × (g)*
P	1.20	21	25.20	-	-	60	72
Q	1.80	36	64.80	-	-	135	243
R	3.00	46	138.00	25	75	-	-

Since each worker has been guaranteed at 75% of basic pay, if his earnings are less than 50% of basic pay, therefore, workers A and C will be paid the wages as computed viz., Rs. 228 and Rs. 315 respectively. The computed wage of worker B is Rs. 75 which is less than 50% of basic pay viz., Rs. 100 therefore he would be paid 75% × Rs. 200 or s. 150.

Working Notes:

1. Piece rate / per unit

Product	*Standard time per unit in minutes*	*Piece rate each minute Rs.*	*Piece rate per unit Rs.*
(a)	*(b)*	*(c)*	*(d) = (b) × c*
P	12	0.10	1.20
Q	18	0.10	1.80
R	30	0.10	3.00

2. Time allowed to each worker

Worker A = 21 units × 12 minutes + 36 units × 18 minutes+46 units × 30 minutes

= 2,280 minutes = 38 hours

Worker B = 25 units × 30 minutes = 750 minutes = 12.5 hours

Worker C = 60 units × 12 minutes + 135 units × 18 minutes

= 720 minutes + 2.430 minutes = 3,150 minutes = 52.50 hours

(iv) Computation of wages of each worker under Premium bonus basis (where each worker receives bonus based on Rowan Scheme)

Workers	*Time allowed hours (Refer to W. Note 2)*	*Time taken hours*	*Time saved hours*	*Wage rate/hour* Rs.	*Earnings* Rs.	*Bonus* Rs.	*Total of earning & bonus* Rs.
A	38.00	38.00	-	6.00	228.00	-	228.00
B	12.50	40.00	-	5.00	200.00	-	200.00
C	52.50	34.00	18.50	7.20	244.80	86.26	331.06

Question 36

What do you understand by labour turnover? How is it measured?

(May, 2003, 1+4 marks)

Answer

Labour turnover in an organization is the rate of change in the composition of labour force during a specified period measured against a suitable index. The standard of usual labour turnover in the industry or labour turnover rate for a past period may be taken as the index or norm against which actual turnover rate should be compared.

The methods for measuring labour turnover are:

$$\text{Replacement method} = \frac{\text{Number of employees replaced during the year}}{\text{Average number of employees on roll during the year}} \times 100$$

$$\text{Separation method} \quad \frac{\text{Number of employees separated during the year}}{\text{Average number of employees on roll during the year}} \times 100$$

$$\text{Flux method} = \left[\frac{\text{No. of employees replaced during the year} + \text{No. of employees separated during the year}}{\text{Average number of employees on roll during the year}}\right] \times 100$$

Question 37

A skilled worker in XYZ Ltd. Is paid a guaranteed wage rate of Rs. 30 per hour. The standard time per unit for a particular product is 4 hours. P, a machineman, has been paid wages under the Rowan Incentive Plan and he had earned an effective hourly rate of Rs. 37.50 on the manufacture of that particular product.

What could have been his total earnings and effective hourly rate, had he been put on Halsey Incentive Scheme (50%)? (Nov., 1999, 5 marks)

Answer

Working note:

Let T hours be the total time worked in hours by the skilled worker (machineman P); Rs 30/- is the rate per hour; standard time is 4 hours per unit and effective hourly earning rate is Rs. 37.50 then

$$\text{Earning} = \text{Hours worked} \times \text{Rate per hour} + \frac{\text{Time saved}}{\text{Time allowed}} \times \text{Time taken} \times \text{Rate per hour}$$

(Under Rowan incentive plan)

$$\text{Rs. } 37.5\,T = T \times \text{Rs. } 30 + \frac{(4 - T)}{4} \times T \times \text{Rs. } 30 = \text{Rs. } 105$$

$$\text{Rs. } 37.5 = \text{Rs. } 30 + (4 - T) \times \text{Rs. } 7.5$$

$$\text{Or Rs. } 7.5\,T = \text{Rs. } 22.5$$

$$\text{Or } T = 3 \text{ hours}$$

Total earnings and effective hourly rate of skilled worker (machineman P) under Halsey Incentive Scheme (50%)

Total earnings = Hours worked × Rate per hour + ½ Time saved × Rate per hour

(under 50% Halsey Incentive Scheme)

= 3 hours × Rs. 30 + ½ × 1 hour × Rs. 30

$$\text{Effective hourly rate} = \frac{\text{Total earnings}}{\text{Hours taken}} = \frac{\text{Rs. } 105}{3 \text{ hours}} = \text{Rs. } 35/-$$

Question 38

A worker produced 200 units in a week's time. The guaranteed weekly wage payment for 45 hours is Rs. 81. The expected time to produce one unit is 15 minutes which is raised further by 20% under the incentive scheme. What will be the earnings per hour of that worker under Halsey (50% sharing) and Rowan bonus schemes?

(May, 1995, 6 Marks)

Answer

Earning per hour under Halsey (50% sharing) Bonus Scheme

$$\text{Time allowed for actual weekly production} = \frac{200 \text{ units} \times 18 \text{ minutes}}{60 \text{ minutes}}$$

(Refer to Working Note 1) = 60 hours

Time saved = Time allowed - Actual time taken

= 60 hours – 45 hours = 15 hours

Earning = (Hours worked × Rate per hour) + ½ (Time saved) × Rate per hour

= 45 hours × Rs. 1.80 + ½ ×15 hour × Rs. 1.80

(Refer to Working Note 2)

= Rs. 81 + Rs. 13.50 = Rs. 94.50

$$\text{Earnings (per hour)} = \frac{\text{Rs. } 94.50}{45 \text{ hours}} = \text{Rs. } 2.10 \text{ per hour}$$

Earnings per hour under Rowan Bonus Scheme

$$\text{Earnings} = \text{Hours worked} \times \text{Rate per hour} + \frac{\text{Time saved}}{\text{Time allowed}} \times \text{Time taken} \times \text{Rate per hr}$$

$$= 45 \text{ hours} \times \text{Rs. } 1.80 + \frac{15 \text{ hours}}{60 \text{ hours}} \times 45 \text{ hours} \times \text{Rs. } 1.80$$

$$\text{Earning per hour} = \frac{\text{Rs. } 101.25}{45 \text{ hour}} = \text{Rs. } 2.25 \text{ per hour}$$

Working Notes:

1. Expected time to produce one unit under incentive scheme = 15 × 120 minutes
   = 18 minutes
2. Wage rate per hour (Rs. 81/45 hours) = Rs. 1.80

Question 39

From the following information, calculate Labour turnover rate and Labour flux rate:

No. of workers as on 0.01.2000 = 7, 600

No. of workers as on 31.12.2000 = 8,400

During the year, 80 workers left while 320 workers were discharged 1,500 workers were recruited during the year of these, 300 workers were recruited because of exits and the rest were recruited in accordance with expansion plans. (May ,2001, 4 marks)

Answer

Labour turnover rate:

It comprises of computation of labour turnover by using following methods:

(i) Separation Method:

$$= \frac{\text{No. of workers left} + \text{No. of workers discharged}}{\text{Average number of workers}} \times 100$$

$$= \frac{(80 + 320)}{(7{,}600 + 8{,}400) \div 2} \text{x}100$$

$$= \frac{400}{8{,}000} \text{x}100 = 5\%$$

(ii) Replacement Method:

$$= \frac{\text{No. of workers replaced}}{\text{Average number of workers}} \text{x}100$$

$$= \frac{300}{8000} \text{x}100 = 3.75\%$$

(iii) New Recruitment:

$$= \frac{\text{No. of workers newly recruited}}{\text{Average number of workers}} \times 100$$

$$= \frac{1{,}200}{8{,}000} \times 100 = 15\%$$

(iv) Flux Method:

$$= \frac{\text{No. of separations} + \text{No. of accessions}}{\text{Average number of workers}} \times 100$$

$$= \frac{(400 + 1500)}{(7{,}600 + 8{,}400) \div 2} \times 100$$

$$= \frac{1{,}900}{8{,}000} \times 100 = 23.75\%$$

Question 40

Discuss the two types of cost associated with labour turnover.

(Nov., 1999, 4 marks)

Answer

Types of cost associated with labour turnover

Two types of costs which are associated with labour turnover are:

(i) *Preventive costs:* These includes costs incurred to keep the labour turnover at a low level i.e., cost of medical schemes. If a company incurs high preventive costs, the rate of labour turnover is usually low.

(ii) *Replacement costs:* These are the costs which arise due to high labour turnover. If men leave soon after they acquire the necessary training and experience of work, additional costs will have to be incurred on new workers, i.e., cost of advertising, recruitment, selection, training and induction, extra cost also incurred due to abnormal breakage of tools and machines, defectives, low output, accidents etc., caused due to the inefficiency and inexperienced new workers.

It is obvious that a company will incur very high replacement costs if the rate of labour turnover is high. Similarly, only adequate preventive costs can keep labour turnover at a low level. Each company must, therefore, workout the optimum level of labour turnover keeping in view its personnel policies and the behaviour of replacement costs and preventive costs at various levels of labour turnover rates.

Question 41

Write short note on Labour Turnover. *(May ,1996, 4 marks)*

Answer

Labour Turnover: It is the rate of change in the labour force during a specified period measured against a suitable index. The standard or usual labour turnover in the industry or locally or the labour turnover rate for a past period may be taken as the index or norm against which actual turnover rate is compared. The methods of calculating labour turnover.

$$\text{Labour Turnover} = \frac{\text{No. of employees replaced}}{\text{Average number of employees on roll}}$$

Or

$$= \frac{\text{Number of employees separated during a year}}{\text{Average number of employees on rolls during the year}}$$

$$= \frac{\text{No. of employees separated + No. of employees replaced}}{\text{Average number of employees on rolls during the period}}$$

Causes of labour turnover: The main causes of labour turnover in an organization/industry can be broadly classified under the following three heads:

(a) Personal Causes.

(b) Unavoidable Causes, and

(c) Avoidable Causes

Personal causes are those which induce or compel workers to leave their jobs such causes includes the following:

(i) Change of jobs for betterment.

(ii) Premature retirement due to ill health or old age.

(iii) Domestic problems and family responsibilities.

(iv) Discontentment over the jobs and working environment.

In all the above causes the employee leaves the organization at his will and, therefore, it is difficult to suggest any possible remedy in the first three cases. But the last one can be overcome by creating conditions leading to a healthy working environment. For this, officers should play a positive role and make sure that their subordinates work under healthy working environment.

Unavoidable causes are those under which it becomes obligatory on the part of management to ask some or more of their employees to leave the organization, such causes are summed up as listed below:

(i) Seasonal nature of the business;

(ii) Shortage of raw material, power, slack market for the product etc;

(iii) Change in the plant location;

(iv) Disability, making a worker unfit for work;

(v) Disciplinary measures;

(vi) Marriage (generally in the case of women).

Avoidable causes are those which require the attention of management on a continuous basis so as to keep the labour turnover ratio as low as possible. The main causes under this case are indicated below:

(1) Dissatisfaction with job, remuneration, hours of work, working conditions, etc.

(2) Strained relationship with management, supervisors or fellow workers;

(3) Lack of training facilities and promotional avenues.

(4) Lack of recreational and medical facilities;

(5) Low wages and allowances.

Proper and timely management action can reduce the labour turnover appreciably so far as avoidable causes are concerned.

Effects: The effect of labour turnover on cost of production is that high labour turnover increases the cost of production in the following ways:

(i) Even flow of production is disturbed;

(ii) Efficiency of new workers is low, productivity of new but in experienced workers is low in the beginning.

(iii) There is increased cost of training and induction;

(iv) New workers cause increased breakage of tools, wastage of materials etc.

In some companies, the labour turnover rate is as high as 100%; it means that on the average, all the work is being done by new and inexperienced workers. This is bound to lower efficiency and production and increase the cost of production.

Remedial steps to minimize labour turnover:

The following steps are useful for minimizing labour turnover.

1. *Exist Interview:* An interview may be arranged with each outgoing employee to ascertain the reasons of his leaving the organization.
2. *Job analysis and evaluation:* Before recruiting workers, job analysis and evaluation may be carried out to ascertain the requirements of each job.
3. *Scientific system of recruitment, placement and promotion:* The organization should make use of a scientific system of recruitment selection, placement and promotion for employees.
4. *Enlightened attitude of management:* The management should introduce the following steps for creating a healthy working atmosphere.
   (i) Service rules should be framed, discussed and approved among management and workers, before their implementation.
   (ii) Provide facilities for education and training of workers.
   (iii) Introduce a procedure for settling workers grievance.
5. *Use of Committee:* Issues like control over workers handling their grievances etc., may be dealt by a committee, comprising of members from management and workers.

Question 42

A job can be executed either through workman A or B. A takes 32 hours to complete the job while B finishes it in 30 hours. The standard time to finish the job is 40 hours.

The hourly wage rate is same for both the workers. In addition workman A is entitled to receive bonus according to Halsey plan (50%) sharing while B is paid bonus as per Rowan plan. The works overheads are absorbed on the job at Rs. 7.50 per labour hour worked. The factory cost of the job comes to Rs, 2,600 irrespective of the workman engaged.

Find out the hourly wage rate and cost of raw materials input. Also show cost against each element of cost included in factory cost. (Nov., 1997,10 marks)

Answer

Working notes:

1. *Time saved and wages:*

Workmen	*A*	*B*
Standard time (hrs.)	40	40
Actual time taken (hrs.)	32	30
Time saved (hrs.)	08	10
Wages paid @ Rs. x per hr. (Rs.)	32x	30x

2. *Bonus Plan:*

	Halsey	*Rowan*
Time saved (hrs.)	8	10
Bonus (Rs.)	4x	7.5x
	$\left[\frac{8 \text{ hrs} \times \text{Rs. x}}{2}\right]$	$\left[\frac{10 \text{ hrs}}{40 \text{ hrs}} \times 30\text{hrs} \times \text{Rs. x}\right]$

3. *Total wages:*

Workman A: 32x + 4x = Rs. 36x

Workman B: 30x + 7,5x = Rs. 37.5x

Statement of factory cost of the job

Workmen	*A*	*B*
	Rs.	*Rs.*
Material cost	y	y
Wages	36x	37.5x
(Refer to working note 3)		
Works overhead	240	225
Factory cost	2,600	2,600

The above relations can be written as follows:

36x + y + 240 = 2,600 …. (i)

37.5x+ y+ 225 = 2,600 …..(ii)

Subtracting (i) from (ii) we get

1.5x – 15 = 0

or 1.5 x = 15

or x = Rs. 10 per hour

On substituting the value of x in (i) we get y = Rs. 2,000

Hence the wage rate per hour is Rs. 10 and the cost of raw material input is Rs. 2,000 on the job.

Question 43

The management of Sunshine Ltd. wants to have an idea of the profit lost/foregone as a result of labour turnover last year.

Last year sales accounted to Rs. 66,000,000 and the P/V Ratio was 20%. The total number of actual hours worked by the direct labour force was 3.45 lakhs. As a result of the delays by the Personnel Department in filling vacancies due to labour turnover, 75,000 potential productive hours were lost. The actual direct labour hours included 30,000 hours attributable to training new recruits, out of which half of the hours were unproductive. The costs incurred consequent on labour turnover reveled on analysis the following:

	Rs.
Settlement cost due to leaving	*27,420*
Recruitment costs	*18,725*
Selection costs	*12,750*
Training costs	*16,105*

Assuming that the potential production lost due to labour turnover could have been sold at prevailing prices, ascertain the profit foregone/lost last year on account of labour turnover.

(May, 1998, 8 marks)

Answer

Working notes:

1.	*Actual productive hours*	3,30,000
	(Actual hours worked – Unproductive training hours)	
	(3,45,000 hrs. – 15,000 hrs.)	
2.	*Sales per productive hour (Rs.)*	20
	(Total Sales/Actual productive hours)	
	(Rs. 66,00,000/3,30,000 hrs.)	

3.	*Potential productive hours lost*	75,000
4.	*Sales foregone* (Rs.) (75,000 hours × Rs. 20)	15,00,000
5.	*Contribution foregone* (Rs.) P/V ratio × Sales foregone) (20% × Rs. 15,00,000)	3,00,000

Statement of Profit foregone

as a result of labour turnover of M/s. Sunshine Ltd.

	Rs.
Contribution foregone	3,00,000
(Refer to working note 5)	
Settlement cost due to leaving	27,420
Recruitment costs	18,725
Selection costs	12,750
Training costs	16,105
Total profit foregone	3,75,000

Question 44

Write Short note on Labour Turnover. *(Nov., 1994, 4 marks)*

Answer

Labour Turnover: Leaving and coming of workers in business or organization gives rise to the phenomenon of labour turnover. Labour turnover of an organization is the rate of change in its labour force during a specified period. This rate of change is compared with an index which acts as a thermometer to ascertain its reasonableness. The suitable index of labour turnover may be the standard or usual labour turnover in the industry locality, or the labour turnover rate for a past period. A higher labour turnover reflect that the workers in the organization are new and inexperienced, and it is a matter of concern to the organization. Also it accounts for an increase in cost of production and even disturbs the even flow of production in the market.

To measure labour turnover, the following three methods viz., (i) Separation method; (ii) Replacement method and (iii) Flux method are available. Each method emphasizes on different aspects. But it is expected from business concerns that a particular method be used consistently to facilitate comparison of data from year to year. Labour turnover may be calculated by using any one of the following formulae:

$$\text{Labour turnover} = \frac{\text{Number of employees replaced}}{\text{Average Number of employees on roll}} \times 100$$

$$\text{OR} = \frac{\text{Number of employees left}}{\text{Average Number of employees on roll}} \times 100$$

$$\text{OR} = \frac{\text{Number of employees joining plus number of their leaving}}{\text{Average Number of employees on roll}} \times 100$$

Causes of Labour Turnover: The main causes of labour turnover in an organization/industry can be broadly classified under the following heads:

(a) Personal Causes

(b) Unavoidable Causes

(c) Avoidable Causes

Remedial steps to minimize labour turnover: The following remedial steps are useful in minimizing labour turnover.

1. Exit Interview
2. Job analysis and evaluation
3. Scientific system of recruitment, selection, placement and promotion.
4. Enlightened attitude of management
5. Use of committee.

Question 45

Calculate the earnings of workers A, B and C under Straight Piece Rate System and Merrick's Multiple Piece Rate System from the following particulars:

Normal Rate per Hour *Rs. 5.40*

Standard Time per Unit *1 Minute*

Output per day is as follows:

Worker A – 390 Units

Worker B – 450 Units

Worker C– 600 Units

Working hours per day are 8. *(May 1998, 8 marks)*

Answer

Working notes:

1. Normal wage rate per unit

Normal rate per hour	Rs. 5.40	
Standard output per hour	60 units	
Normal wage rate per unit	0.09 P	
(Rs. 5.40/60 units)		

2. *Efficiency level*

Workers:	*A*	*B*	*C*
Actual output per day (units)	390	450	600
Standard output per day (units)	480	480	480
Efficiency level achieved	81.25%	93.75%	125%
$\left[\frac{\text{Actual output units}}{\text{Standard output units}}\right] \times 100$	$\left[\frac{390}{480} \times 100\right]$	$\left[\frac{450}{480} \times 100\right]$	$\left[\frac{600}{480} \times 100\right]$

Earnings of Workers Under Straight Piece Rate System

Worker A = 390 units × Rs. 0.09 = Rs. 35.10 P

Worker B = 450 units × Rs. 0.09 = Rs. 40.50 P

Worker C = 600 units × Rs. 0.09 = Rs. 54.00

Earnings of Workers Under Merrick's Multiple Piece Rate System

Workers:	*A*	*B*	*C*
Efficiency level	81.25%	93.75%	125%
(Refer to Working note 2)			
Applicable wage rate per unit	0.09P	0.099	0.108*P
Earnings (Rs.)	35.10	44.55	64.80
	(390 units × 0.09P)	(450 units + 0.099P)	(600 units × 0.108)

*** Note :** Some author suggests an increase of 30% over normal piece rate at an efficiency level of 120% or more. In such a case the rate per unit would be 0.117 P and total earnings would come to Rs. 70.20 P.

Question 46

The management of a company are worried about their increasing labour turnover in factory and before analyzing the causes and taking remedial steps, they want to have idea of the profit foregone as –a result of labour turnover in the last year.

Last year sales amounted to Rs. 83,03,300 and the profit-volume ratio was 20 per cent. Total number of actual hours worked by the Direct Labour Force was 4.45 lakhs. As a result of the delays by the Personnel Department in filling vacancies due to labour turnover, 1,00,000 potentially productive hours were lost. The actual direct labour hours includes 30,000 hours attributable to training new recruits, out of which half of the hours were unproductive.

The costs incurred consequent on labour turnover revealed on analysis the following:

	Rs.
Settlement costs due to leaving	*43,820*
Recruitment costs	*26,740*
Selection costs	*12,750*
Training costs	*30,490*

Assuming that the potential production lost as a consequence of labour turnover could have been sold at prevailing prices, find the profit foregone last year on account of labour turnover. *(Nov., 2004, 8 marks)*

Answer

Working notes:

1.	*Actual productive hours*	
	Total number of actual hours worked	4,45,000
	Less: Unproductive training hours	15,000
	Actual productive hours	4,30,000
2.	*Sales per productive hours (Rs.)*	
	(Total sales / Actual productive hours.)	Rs. 19.309
	(Rs. 83,03,000 / 4,30,000 hours)	
3.	*Potential productive hours lost*	1,00,000
4.	*Sales foregone (Rs.)*	19,31,000
	(1,00,000 hours × Rs. 19.31)	
5.	*Contribution foregone (Rs.)*	3,86,000
	Sales foregone × P/V Ratio	
	(Rs. 19,31,000 × 20%)	

Statement of Profit foregone last year
on account of Labour Turnover

Contribution foregone *(Refer to working note 5)*	3,86,000
Settlement costs due to leaving	43,820
Recruitment costs	26,740
Selection costs	12,750
Training costs	30,490
Total profit foregone	5,00,000

Question 47

State the distinction between Job evaluation and Merit rating. (Nov., 2001, 3 marks)

Answer

Distinction between Job evaluation and Merit rating:

Job evaluation can be defined as the process of analysis and assessment of jobs to ascertain reliably their relative worth and to provide management with a reasonably sound basis for determining the basic internal wage and salary structure for the various job positions. In other words, job evaluation provides a rationale for differential wages and salaries for different group of employees and ensures that these differentials are consistent and equitable.

Merit rating is the quantitative or qualitative assessment of an employee's personality or his performance on the job made by his supervisor or other person qualified to judge.

The main points of distinction between job evaluation and merit rating are as follows:

1. Job evaluation is the assessment of the relative worth of jobs within a company and merit rating is the assessment of the relative worth of the man behind a job. In other words, merit rating rates employees on their job while job evaluation rate the jobs.
2. Job evaluation and its accomplishments are meant to set up a rational wage and salary structure whereas merit rating provides a scientific basis for determining fair wages for each worker based on his ability and performance.
3. Job evaluation simplifies wage administration by bringing a uniformity in wage rates. On the other hand, merit rating is used to determine fair rate of pay for different workers on the basis of their performance.

Question 48

The finishing shop of a company employs 60 direct workers. Each worker is paid Rs. 400 as wages per week of 40 hours. When necessary, overtime is worked upto a maximum of 15 hours per week per worker at time rate plus one-half as premium. The current output on an average is 6 units per man hour which may be regarded as standard output. If bonus scheme is introduced, it is expected that the output will increase to 8 units per man hour. The workers

will, if necessary, continue to work Overtime upto the specified limit although no premium on incentives will be paid.

The company is considering introduction of either Halsey Scheme or Rowan Scheme of Wage Incentive system. The budgeted weekly output is 19,200 units. The selling price is Rs. 11 per unit and the direct Material Cost is Rs. 8 per unit. The variable overheads amount to Rs. 0.50 per direct labour hour and the fixed overhead is Rs, 9,000 per week.

Prepare a Statement to show the effect on the Company's weekly Profit of the proposal to introduce (a) Halsey Scheme, and (b) Rowan Scheme.

(May, 2002, 8 marks)

Answer

Working notes:

1.	*Total available hours per week* (60 workers × 40 hours)	2,400
2.	*Total standard hours required to produce 19,200 units* (19,200 units/6 units per hour)	3,200
3.	*Total labour hours required after the introduction of bonus scheme to produce 19,200 units* (19,200 units / 8 units per man hour)	2,400
4.	*Time saved in hours* (3,200 hours – 2,400 hours)	*800*
5.	*Wage rate per hour (Rs.)* (Rs. 400/40 hours)	10
6.	*Bonus:*	

(a) Halsey Scheme $= \frac{1}{2}$ × Time saved × Wage rate per hour

$= \frac{1}{2}$ x 800 hours x Rs. 10 = Rs. 4,000

(b) Rowan Scheme $= \frac{\text{Time saved}}{\text{Time allowed}}$ × Time taken × Wage rate per hour

$= \frac{800 \text{ hours}}{3,200 \text{ hours}}$ × 2,400 hours × Rs. 10

= Rs. 6,000

Statement showing the effect on the Company's Weekly present profit by the introduction of Halsey & Rowan schemes

	Present	*Halsey*	*Rowan*
	Rs.	*Rs.*	*Rs.*
Sales revenue: (A) *(19,200 units × Rs. 11)*	2,11,200	2,11,200	2,11,200
Direct material cost *(19,200 units × Rs. 8)*	1,53,600	1,53,600	1,53,600
Direct wages *(Refer to working notes 2 & 3)*	32,000 *(3,200 hrs × Rs. 10)*	24,000 *2,400 hrs × Rs. 10)*	24,000 *(2,400 hrs. ×Rs. 10)*
Overtime premium	4,000 *(800 hrs. × Rs. 5)*	-	-
Bonus *(Refer to working notes 6 (i) & (ii))*	-	4,000	6,000
Variable overheads	1,600 *(3,200 hrs. × 0.50 P)*	1,200 *(2,400 hrs. × 0.50 P)*	1,200 *(2,400 hrs. × 0.50 P)*
Fixed overheads	9,000	9,000	9,000
Total cost : (B)	2,00,200	1,91,800	1,93,800
Profit: {(A)- (B)}	11,000	19,400	17,400

Question 49

The management of In and Out Ltd., are worried about their increasing labour turnover in the factory and before analyzing the causes and taking remedial steps, they want to have an idea of the profit foregone as a result of labour turnover in the last year.

Last year sales amounted to Rs. 83,03,300 and the P/V ratio was 20 per cent. The total number of actual hours worked by the Direct Labour force was 4.45 lakhs. As a result of the delays by the Personnel Department in filling vacancies due to labour turnover, 1,00,000 potentially productive hours were lost. The actual direct labour hours included 30,000 hours attributable to training new recruits, out of which half of the hours were unproductive.

The costs incurred consequent on labour turnover revealed on analysis the following:

	Rs.
Settlement cost due to leaving	*43,820*

Recruitment costs	*26,740*
Selection costs	*12,750*
Training costs	*30,490*

Assuming that the potential production lost as a consequence of Labour Turnover could have been sold at prevailing prices, find the profit foregone last year on account of labour turnover.

Answer

Statement of Profit Foregone last year on account of labour turnover of In and Out Ltd.

	Rs.
Contribution foregone	3,86,200
(See Notes 1 to 4)	
Settlement cost due to leaving	43,820
Recruitment Costs	26,740
Selection Costs	12,750
Training Costs	30,490
	5,00,000

Working Notes:

1. Actual hours worked: 4,45,000
   Less: 15,000 unproductive training hours: 15,000
   Actual productive hours. 4,30,000
2. Sales Rs. 83,03,300
   Actual productive hours utilized 4,30,000 hours
   Sales per productive hours = $\text{Rs. } \frac{83,03,300}{4,30,000} = \text{Rs. } 19.30$
3. Potential productive hours lost = 1,00,000
   Sales foregone = 1,00,000 hours × Rs. 19.31
   = Rs. 19,31,000
4. Contribution foregone = Sales foregone × P/V Ratio.
   = Rs. 19,31,000 × 20%
   = Rs. 3,86,200

Question 50

The standard hours of job X is 100 hours. The job has been completed by Amar in 60 hours, Akbar in 70 hours and Anthony in 95 hours.

The bonus system applicable to the job is as follows:-

Percentage of time saved to time allowed	*Bonus*
Saving upto 10%	*10% of time saved*
From 11% to 20%	*15% of time saved*
From 21% to 40%	*20% of time saved*
From 41% to 100%	*25% of time saved*

The rate of pay is Re. 1 per hour, Calculate the total earnings of each worker and also the rate of earnings per hour.

Statement of total earnings and rate of earning per hour

Workers:	*Amar*	*Akbar*	*Anthony*
Standard hours of Job	100 hours	100 hours	100 hours
Time taken on the Jobs (i)	60 hours	70 hours	95 hours
Time saved	40 hours	30 hours	5 hours
Percentage of time saved to time allowed	40%	30%	5%
Bonus hours (ii) *(See Note 1)*	6.5 hours	4.5 hours	0.5 hours
Total hours to be paid [(i) + (ii)]	66.5 hours	74.5 hours	95.5 hours
Total earning @ Re. 1/- p.h.	Rs. 66.5	Rs. 74.5	Rs. 95.5
Rate of earning per hour *(See Note 2)*	Rs. 1.1083	Rs. 1.0642	Rs. 1.005

Note:

1. *Bonus hours as percentage of time saved:*

   Amar : 10 hours × 10% + 10 hours × 15%
   + 20 hours × 20% = 6.5 hours

   Akbar : 10 hours × 10% + 10 hours × 15%
   + 10 hours × 20% = 4.5 hours

   Anthony : 5 hours × 10% = 0.5 hours

2. *Rate of Earning per hour:*

$$= \frac{\text{Total earning}}{\text{Total time taken on the job}}$$

Amar : $\frac{\text{Rs. } 66.5}{60 \text{ hours}} = \text{Rs. } 1.1038$

Akbar : $\frac{\text{Rs. } 74.5}{70 \text{ hours}} = \text{Rs. } 1.0642$

Anthony : $\frac{\text{Rs. } 95.50}{95 \text{ hours}} = \text{Rs. } 1.005$

Question 51

Distinguish between Direct and Indirect labour. *(November, 2001, 2 marks)*

Answer

Direct labour cost is the labour costs that is specifically incurred for or can be readily charged to or identified with a specific job, contract, work-order or any other unit of cost.

Indirect labour costs are labour costs which cannot be readily identified with products or services but are generally incurred in carrying out production activity.

The importance of the distinction lies in the fact that whereas direct labour cost can be identified with and charged to the job, indirect labour costs cannot be so charged and are, therefore, to be treated as part of the factory overheads to be included in the cost of production.

Question 52

What do you understand by overtime premium? What is the effect of overtime payment on productivity and cost? Discuss the treatment of overtime premium in cost accounts and suggest a procedure for control of overtime work.

Answer

Work done beyond normal working hours is known as overtime work. Overtime payment is the amount of wages paid for working beyond normal working hours. The rate for overtime work is higher than the normal time rate; usually it is at double the normal rates. The extra amount so paid over the normal rate is called overtime premium. Overtime work should be resorted to only when it is extremely essential because it involves extra cost. The overtime payment affects to increase the cost of production in the following ways:

(2) The premium paid is an extra payment in addition to the normal rate.

(3) The efficiency of operators during overtime work may fall and thus the output may be lesser than normal output.

(4) In order to earn more the workers may not concentrate on work during normal time and thus the output during normal hours may also fall.

(5) Reduced output and increased premium will bring about an increase in costs of production.

Under cost accounting the overtime premium is treated as follows:

(i) If overtime is resorted to, at the desire of the customer, then overtime premium may be charged to the job directly.

(ii) If overtime is due to a general pressure of work to increase the output, the premium may be charged to general overheads.

(iii) If overtime is due to the negligence or delay, it may be charged to the department concerned.

(iv) If it is due to circumstances beyond control, e.g. fire, strike etc. it may be charged to Costing Profit and Loss Account.

It is necessary that proper Control over the overtime work should be exercised in order to keep it to the minimum. The procedure based on following steps may be adopted for such control.

(1) Watch on the output during normal hours should be maintained to ensure that overtime is not granted when normal output is not obtained during the normal hours, without any special reasons.

(2) Statement concerning overtime work be prepared along with justifications, at appropriate places for putting up before competent authority.

(3) Prior sanction about overtime should be obtained from competent authority.

(4) Actual rate of output produced during the overtime period should be compared with normal rate of output.

(5) Periodical reports on overtime wages should be sent to top management for taking corrective action

(6) If possible an upper limit may be fixed for each category of worker in respect of overtime.

Question 53

During audit of accounts of G. Company, your assistant found errors in the calculation of the wages of factory workers and he wants you to verify his work.

He has extracted the following information:

(i) The contract provides that the minimum wage for a worker is his base rate. It is also paid for downtimes i.e. the machine is under repair or the worker is without work. The standard work week is 40 hours. For overtime production, workers are paid 150 per cent of base rates.

(ii) Straight Piece Work-The worker is paid at the rate of 20 paise per piece.

(iii) Percentage Bonus Plan- Standard quantities of production per hour are established by the engineering department. The workers' average hourly production, determined from his total hours worked and his production, is divided by the standard quantity of production to determine his efficiency ratio. The efficiency ratio is then applied to his base rate to determine his hourly earnings for the period.

(iv) Emerson Efficiency Plan- A minimum wages is paid for production upto 66-2/3% of standard output or efficiency. When the workers production exceeds 66-2/3% of the standard output, he is paid bonus as per the following table:

Efficiency Level	*Bonus*
Upto $66\frac{2}{3}\%$	*Nil*
Above $66\frac{2}{3}\%$ to 79%	*10%*
80% - 99%	*20%*
100% - 125%	*45%*

Your assistant has produced the following schedule pertaining to certain workers of a weekly pay roll:

Workers	*Wage Incentive Plan*	*Total Hours*	*Down Time Hours*	*Units Produced*	*Standard Units*	*Base Rate*	*Gross Wages as per Book*
						Rs.	*Rs.*
Rajesh	*Straight piece work*	*40*	*5*	*400*	*-*	*1.80*	*85*
*Mohan**	*Straight piece work*	*46*	*-*	*455*	*-*	*1.80*	*95*
John	*Straight piece work*	*44*	*-*	*425*	*-*	*1.80*	*85*
Harish	*Percentage bonus plan*	*40*	*4*	*250*	*200*	*2.20*	*120*
Mahesh	*Emerson*	*40*	*-*	*240*	*300*	*2.10*	*93*
Anil	*Emerson (40 hours production)*	*40*	*-*	*600*	*500*	*2.00*	*126*

**Total hours of Mohan include 6 overtime hours.*

Prepare a schedule showing whether the above computation of workers' wages are correct or not. Give details. *(May, 1999, 12 marks)*

Answer

Schedule showing the correct figure of minimum wages; gross wages and wages to be paid.

Workers	*Wage incentive plan*	*Minimum wages*	*Gross wages computed as per incentive plan*	*Gross wage as per book*	*Wages to be paid are Maximum of: minimum and gross computed wages*
		(Rs.)	*(Rs.)*	*(Rs.)*	*(Rs.)*
Rajesh *(Refer to W. Note 1)*	Straight piece work	72.00	80.00	85	80.00
Mohan *(Refer to W. Note 2)*	Straight piece work	88.20	91.00	95	91.00
John *(Refer to W. Note 3)*	Straight piece work	82.80	85.00	85	85.00
Harish *(Refer to W. Note 4)*	Percentage bonus plan	88.00	110.00	120	110.00
Mahesh *(Refer to W. Note 5)*	Emerson	84.00	100.80	93	100.80
Anil *(Refer to W. Note 6)*	Emerson	80.00	116.00	126	116.00

Working notes:

1. Minimum wages = Total normal hours × rate per hour
= 40 hours × Rs. 1.80 = Rs. 72

Gross wages (computed) as per incentive plan = No. of units × rate per unit
= 400 units × Rs. 0.20 = Rs. 80

2. Minimum wages = Total normal hours × rate per hour
+ Overtime hours × Overtime rate per hour
= 40 hours × Rs. 1.80 + 6 hours × Rs. 2.70
= Rs. 72 + Rs. 16.20 = Rs. 88.20

	Gross wages (computed) as per incentive plan	= 455 units × Rs. 0.20 = Rs. 91.00
3.	**Minimum wages**	= 40 hours × Rs. 1.80 + 4 hours × Rs. 2.70
		= Rs. 72 + Rs. 10.80 = Rs. 82.80
	Gross wages (computed) as per incentive plan	= 425 units × Rs. 0.20 = Rs. 85
4.	**Minimum wages**	= 40 hours × Rs. 2.20 = Rs. 88
	Efficiency of worker	$= \frac{\text{Actual production per hour}}{\text{Standard production per hour}} \times 100$
		$= \frac{(250 \text{ units}/ 40 \text{ hours})}{(200 \text{ units}/40 \text{ hours})} \times 100 = 125\%$
	Hourly rate	= Rate per hour × Efficiency of worker
		= Rs. 2.20 × 125% = Rs. 2.75
	Gross wages (computed) as per of bonus plan	= 40 hours × Rs. 2.75 = Rs. 110/-
5.	**Minimum wages**	= 40 hours × Rs. 2.10 = Rs. 84
	Efficiency of worker	$= \frac{(240 \text{ units}/ 40 \text{ hours})}{(300 \text{ units}/40 \text{ hours})} \times 100 = 80\%$
	Bonus (as per Emerson's plan)	= Total minimum wages × Bonus percentage
		= Rs. 84 × 20% = Rs. 16.80
	Gross wages (computed) as per Emerson's Efficiency plan	= Minimum wages + Bonus
		= Rs. 84 + Rs. 16.80 = Rs. 100.80
6.	**Minimum wages**	= 40 hours × Rs. 2 = Rs. 80
	Efficiency of worker	$= \frac{600}{500} \times 100 = 120\%$
	Bonus (as per Emerson's plan)	= Rs. 80 × 45% = Rs. 36
	Gross wages (computed) as per Emerson's Efficiency plan	= Rs. 80 + Rs. 36 = Rs. 116

Question 54

Calculate the earnings of a worker under (i) Halsey Plan and (ii) Rowan Plan from the following particulars:

(1) Hourly rate of wages guaranteed 0.50 paise per hour.

(2) Standard time for producing one dozen articles – 3 hours.

(3) *Actual time taken by the worker to produce 20 dozen articles – 48 hours.*

(Nov., 1998, 6 marks)

Answer

(1) Earnings of a Worker under Halsey Plan

Earnings = Hrs. worked × Rate per hour + ½ Time saved hrs. × Rate per hour

= 48 hrs. × 0.50 paise + ½ × 12 hrs. × 0.50 paise

(Refer to working note 2)

= Rs. 24 + Rs. 3

= Rs. 27

(2) Earnings of a worker under Rowan Plan

$$\text{Earnings} = \text{Hrs. worked} \times \text{Rate per hour} + \frac{\text{Time saved}}{\text{Time allowed}} \times \text{Time taken hrs.} \times \text{Rate per hour}$$

$$= 48 \text{ hrs.} \times 0.50 \text{ paise} + \left(\frac{12}{60}\right) \text{ hrs.} \times 48 \text{ hrs.} \times 0.50 \text{ paise}$$

(Refer to working notes 1 & 2)

= Rs. 24 + Rs. 4.80

= Rs. 28.80

Working notes:

1. *Time Allowed to produce 20 dozen articles*

Standard time allowed for producing one dozen articles	3 hours
Standard time allowed for producing 20 dozen articles	60 hours

2. *Time saved*

Standard time to produce 20 dozen articles	60 hours
Actual time taken by the worker to produce 20 dozen articles	48 hours
Time saved	12 hours

Question 55

The existing Incentive system of Alpha Limited is as under:

Normal working week	*5 days of 8 hours each plus 3 late shifts of 3 hours each*
Rate of Payment	*Day work: Rs. 160 per hour*
	Late shift: Rs. 225 per hour
Average output per operator for 49-hours week i.e. including 3 late shifts	*120 articles*

In order to increase output and eliminate overtime, it was decided to switch on to a system of payment by results. The following Information is obtained:

Time-rate (as usual)	:	*Rs. 160 per hour*
Basic time allowed for 15 articles	:	*5 hours*
Piece-work rate	:	*Add 20% to basic piece-rate*
Premium Bonus	:	*Add 50% to time.*

Required:

Prepare a Statement showing hours worked, weekly earnings, number of articles produced and labour cost per article for one operator under the following systems:

(a) Existing time-rate

(b) Straight piece-work

(c) Rowan system

(d) Halsey premium system

Assume that 135 articles are produced in a 40-hour week under straight piece work, Rowan Premium system, and Halsey premium system above and worker earns half the time saved under Halsey premium system. *(2×4 = 8 Marks)*

Answer

Table showing Labour Cost per Article

Method of Payment	Hours worked	Weekly earnings	Number of articles produced	labour cost per article
Existing time rate	49	Rs. 8,425.00	120	Rs. 70.21
Straight piece rate system	40	Rs. 8,640.00	135	Rs. 64
Rowan Premium System	40	Rs. 9,007.41	135	Rs. 66.72
Halsey Premium System	40	Rs. 8,600.00	135	Rs. 63.70

Working Notes:

(a) Existing time rate

Weekly wages	40 hrs @ Rs160/hr	= Rs6,400
	9 hrs @ Rs225/hr	= Rs2,025
		Rs8,425

(b) Piece Rate System

Basic time:	5 hour for 15 articles.	
	Cost of 15 articles at hourly rate of Rs160/hr	= Rs800
	Add 20%	= Rs160
		Rs960

∴ Rate per article = Rs960 / 15

= Rs64

Earnings for the week = 135 articles × Rs64

= Rs8,640.

(c) Rowan Premium System

Basic Time : 5 hours for 15 articles

Add : 50% to time

7.5 hours for 15 articles

Or 30 minutes per article

∴ Time allowed for 135 articles = 67.5 hours

Actual time taken for 135 articles = 40 hours

∴ Earnings = $(HW \times RH) + \left[\frac{TA - HW}{TA} \times HW \times RH\right]$

= $(40 \text{ hrs} \times \text{Rs}160) + \left(\frac{67.5 - 40}{67.5} \times 40 \times \text{Rs}.160\right)$

= Rs. 9007.41

(d) Halsey Premium System

Earnings = $HW \times RH + \frac{50}{100}(TA - HW) \times RH$

= $40 \times \text{Rs}160 + \frac{1}{2}(67.5 - 40) \times \text{Rs}160$

= Rs8,600.

Question 56

'Under the Rowan Premium Bonus system, a less efficient worker can obtain same bonus as a highly efficient worker.' Discuss with suitable examples. *(May 2007, 4 Marks)*

Answer

$$\text{Bonus under Rowan system} = \frac{\text{Time taken}}{\text{Time allowed}} \times \text{time saved} \times \text{rate per hour}$$

For example let time allowed for a job = 4 hours and Labour rate = Rs. 5 per hour.

Case I : Less efficient worker

If time taken = 3 hours

Then time saved = 4 – 3 = 1 hour

$$\text{Bonus} = \frac{3\,\text{hours}}{4\,\text{hours}} \times 1\,\text{hour} \times \text{Rs.}\,5 = \text{Rs.}\,3.75$$

Case II : Highly efficient worker

If time taken = 1 hour

Then time saved = 4 – 1 = 3 hours

$$\text{Bonus} = \frac{1\,\text{hour}}{4\,\text{hours}} \times 3\,\text{hours} \times \text{Rs.}\,5 = \text{Rs.}\,3.75$$

So, it can be concluded that under Rowan System, the less efficient worker and highly efficient worker can get the same bonus.

Question 57

Two workers 'A' and 'B' produce the same product using the same material. Their normal wage rate is also the same. 'A' is paid bonus according to Rowan scheme while 'B' is paid bonus according to Halsey scheme. The time allowed to make the product is 50 hours. 'A' takes 30 hours while 'B' takes 40 hours to complete the product. The factory overhead rate is Rs. 5 per person-hour actually worked. The factory cost of product manufactured by 'A' is Rs. 3,490 and for product manufactured by 'B' is Rs. 3,600.

Required:

(i) Compute the normal rate of wages.

(ii) Compute the material cost.

(iii) Prepare a statement comparing the factory cost of the product as made by two workers. *(November 2007, 6 Marks)*

Answer

Let *x* be the cost of material and *y* be the normal rate of wage/hour

	Worker A	*Worker B*
	Rs.	*Rs.*
Material cost	*x*	*x*
Labour wages	30 y	40 y
Bonus	Rowan system	Halsey system
	$\frac{\text{Time saved}}{\text{Time allowed}} \times \text{hour worked} \times \text{rate}$	Hours saved × 50% × rate
	$= \frac{20}{50} \times 30 \times y = 12y$	$= 10 \times \frac{1}{2} \times y = 5y$
Overheads	30 × 5 = 150	40 × 5 = 200
Factory cost	x + 42y + 150 = 3,490	x + 45y + 200 = 3,600
	∴ x + 42y = 3,340 – (1)	∴ x + 45y = 3,400 – (2)

Solving (1) and (2) we get

X = 2,500 and y = 20

(i) Normal rate of wages is Rs. 20 per hour.

(ii) Cost of materials = Rs. 2,500.

(iii) **Comparative Statement of factory cost**

	Worker A	*Worker B*
	Rs.	*Rs.*
Material cost	2,500	2,500
Wages	30 × 20 = 600	40 × 20 = 800
Bonus	$\left(\frac{20}{50} \times 30 \times 20\right) = 240$	$\left(10 \times \frac{1}{2} \times 20\right) = 100$
Overheads	30 × 5 = 150	40 × 5 = 200
Factory cost	3,490	3,600

Question 58

Discuss the three methods of calculating labour turnover. *(November 2007, 4 Marks)*

Answer

Methods of calculating labour turnover

(i) $\text{Replacement method} = \frac{\text{Number of employees replaced}}{\text{Average number of employees on roll}} \times 100$

(ii) $\text{Separation method} = \frac{\text{Number of employees separated during the year}}{\text{Average number of employees on roll during the year}} \times 100$

(iii) $\text{Flux method} = \frac{\text{Number of employees separated} + \text{Number of employees replaced}}{\text{Average number of employees on roll during the year}} \times 100$

Workers joining a business concern on account of its expansion do not account for labour turnover.

Question 59

Calculate the total wages earned by a workman for a working day of 8 hours under Halsey and Rowan Plans:

- *Standard production per hour* — *20 units*
- *Actual production of the day* — *200 units*

Wages rate per hour Rs. 30

Answer

(i) $\text{Standard time} = \frac{200}{20} = 10 \text{ hours}$

(ii) Total wages of workman in Halsey Scheme:

Total Wages = (Actual Time × Wages Rate) + 50% (Standard Time – Actual Time) × Wages Rate

$= 8 \times 30 + \frac{50}{100} (10 - 8) \times 30$

= Rs. 270.

(iii) Total wages in Rowan Plan:

$$\text{Total Wages} = (\text{Actual Time} \times \text{Wages Rate}) + \left(\frac{\text{Standard Time} - \text{Actual Time}}{\text{Standard Time}}\right) \times \text{Actual time} \times \text{Wages Rate}$$

$$= 8 \times 30 + \left(\frac{10-8}{10}\right) \times 8 \times 30$$

Question 59

The following information is collected from the personnel department of ST limited for the year ending 31st March, 2008:

Number of workers at the beginning of the year	*8,000*
Number of workers at the end of the year	*9,600*
Number of workers left the company during the year	*500*
Number of workers discharged during the year	*100*
Number of workers replaced due to left and discharges	*700*
Additional workers employed for expansion during the year	*1,500*

You are required to calculate labour turnover rate by using separation method, replacement method and flux method (November 2008, 4 Marks)

Answer

Calculation of labour turnover rate:

1. Separation method:

$$\text{Labour turnover rate} = \frac{\text{Number of workers separated during the year}}{\text{Average number of workers on rolls during the year}} \times 100$$

$$= \frac{600}{8,800} \times 100$$

= 6.82%.

Average Number of workers separated during the year = Number of workers left the company during the year + Number of workers discharged during the year

= 500 + 100 = 600.

$$\text{Average number of workers on rolls during the year} = \frac{8,000 + 9,600}{2} = 8,800$$

2. Replacement Method:

$$\text{Labour turnover rate} = \frac{\text{Number of workers replaced during the year}}{\text{Average number of workers on rolls during the year}} \times 100$$

$$= \frac{700}{8,800} \times 100$$

= 7.95%.

3. Flux Method:

$$\text{Labour turnover rate} = \frac{\text{Number of workers separated} + \text{Number of workers replaced}}{\text{Average number of workers on rolls during the year}} \times 100$$

$$= \frac{600 + 700}{8{,}800} \times 100$$

= 14.77%. = Rs. 288.

4
Overheads

Question 1

(a) Explain with illustrative examples the concept of fixed cost and variable cost.

(b) The following are the Maintenance costs incurred in a machine shop per six months with corresponding machine hours:

Month	*Machine Hours*	*Maintenance Costs Rs.*
January	*2,000*	*300*
February	*2,200*	*320*
March	*1,700*	*270*
April	*2,400*	*340*
May	*1,800*	*280*
June	*1,900*	*290*
Total	*12,000*	*1,800*

Analyse the Maintenance cost which is semi-variable into fixed and variable element.

Answer

(a) **Fixed cost:** it is a cost which accrues in relation to the passage of time and which within certain output or turnover limits, tends to be unaffected by fluctuations in volume of output or turnover. Fixed costs, are thus time based and within certain output limits, they are not affected by changes in the level of activity. Fixed costs are also known as period costs. Rent is an example of fixed cost. In the case of factory, its rent is independent of its volume of production, i.e. whether it produces 1 unit or 1000 units, but its rent remains the same. Other examples of fixed costs are rates, foremen's salary etc.

Variable cost: it is a cost which in the aggregate tends to vary in direct proportion to changes in the volume of output or turnover. For example material cost is a variable cost. If the cost of material for 1 unit of a product is say Rs.5, then the cost of material for 10 units of the product will be Rs. 50. In this way the cost of material is a variable one.

(b) Note**:** This part can be solved by using other methods as well

Workings:

High and low points method

	Machine Hours	*Maintenance Costs Rs.*
High point, April	*2,400*	*340*
Low point, March	*1,700*	*270*
	700	*70*

Rate of change of variable cost = Rs. 70 ÷ 700 hrs.

= Rs. 0.10 per machine hour

Total variable cost for 2,400 machine hour will be Rs. 240

2400 x Rs. 0.10

Hence Fixed cost is *(Rs. 340 – Rs. 240)* = Rs.100

Analysis of maintenance cost into fixed and variable element

	Machine Hours	*Maintenance Cost*	*Fixed Cost*	*Variable Cost.*
		Rs.	*Rs.*	*Rs.*
January	2,000	300	100	200
February	2,200	320	100	220
March	1,700	270	100	170
April	2,400	340	100	240
May	1,800	280	100	180
June	1,900	290	100	190

Question 2

(a) Explain how departmental overhead rates are arrived at.

(b) Selfhelp Ltd. has gensets and produces its own power. Data for power costs are as follows:-

Horse power Hours	*Production deptts.*		*Service deptts.*	
	A	*B*	*X*	*Y*
Needed capacity production	*10,000*	*20,000*	*12,000*	*8,000*
Used during the month of May	*8,000*	*13,000*	*7,000*	*6,000*

During the month of May costs for generating power amounted to Rs. 9,300: of this Rs. 2,500 was considered to be fixed cost. Service Deptt. X renders service to A, B and Y in the ratio 13:6:1, while Y renders service to A and B in the ratio 31:3. Given that the direct labour hours in Deptts. A and B are 1650 hours and 2175 hours respectively, find the Power Cost per labour hour in each of these two Deptts.

Answer

(a) To arrive at the department overhead rates it is necessary to have complete account of overhead expenses. These overhead expenses are either completely assigned to the production and service departments or are apportioned by using suitable basis. This process of distributing overhead expenses between the production and service departments , is known as primary distribution.

As the service departments in an organization are meant for rendering service to other production departments, their expenses are apportioned to the users viz. production departments. This process of apportioning service department expenses to the production departments by using suitable basis is known as secondary distribution.

Thus by using primary and secondary distribution processes, the total overhead expenses are apportioned to the concerned production departments. These total overhead expenses of each production department may be absorbed by using a suitable method of overhead absorption. For example the total overheads of each department may be divided by labour hour, machine hours etc., to arrive at departmental overhead recovery rate.

(b) Statement of overhead Distribution of a Selfhelp Ltd.

Particulars	*Basis*	*Total*	*Production*		*Service Deptts.*	
			A	*B*	*X*	*Y*
		Rs.	*Rs.*	*Rs.*	*Rs.*	*Rs.*
Fixed Cost	H.P. Hours needed at capacity production (5:10:6:4)	2,500	500	1,000	600	400
Variable Cost	H.P. Hours used (8:13:7:6)	6,800	1,600	2,600	1,400	1,200
		9,300	2,100	3,600	2,00	1,600

Redistribution of Service Departments' Expenses to Production Departments

Particulars	*Total*	*Production Deptts.*		*Service Deptts.*	
		A	*B*	*X*	*Y*
Total overheads (Rs.)	9,300	2,100	3,600	2,000	1,600
Deptt. X overhead (Rs.) apportioned to A,B And Y in the ratio (13:6:1)		1,300	600	–2,000	100
Deptt. Y overhead (Rs.) apportioned to A and B in the ratio (31:3)		1,550	150		–1,700

Total overheads (Rs.)	—	4,950	4,350	–	–
Labour hours		1,630	2,175		
Power Cost per labour labour		3.00	2.00		

Question 3

The level of production activity fluctuates widely in your company from month to month. Because of this, the incidence of depreciation on unit cost varies considerably. The management decides that you should find out a suitable method to correct this.

Answer

Depreciation is usually charged on the basis of time. One simple method used for the purpose is known as straight line method. Under this method, the cost of acquisition plus the installation charges minus the scrap value, is spread over the estimated life of the asset to arrive at the annual depreciation charge. For example, suppose the cost of a machine used by a concern for manufacturing its products is Rs.1,20,000. Its life is, say, 10 years. Then the charge of depreciation per annum would be Rs.12,000 or Rs.1,000 p.m. Suppose further that the units manufactured by this machine in the months of March and April are 500 and 1,000 respectively. Then the rate of depreciation to be charged to each unit manufactured in the month of March and April will be Rs. 2 and Re. 1 respectively. This incidence of depreciation on unit cost, due to wide fluctuations in the production activity can be overcome by using the method known as *production unit method*.

Under production unit method, depreciation is charged at a rate per unit of production, by dividing the cost of the assets by the estimated number of unit to be produced during the life of the asset. The formula for calculating depreciation under this method is :-

$$D = \frac{\text{Original Cost} - \text{Residual Value}}{\text{Estimated output during its life}}$$

This method recognises the fact that depreciation should vary according to the volume of the output. It satisfies the costing requirement that the cost of an asset should be evenly spread over the work done by it. According to this method, the incidence of depreciation only arises when the asset is employed in production and not when it remains idle. It does not recognize the time factor, but only the usage factor. Consequently, no depreciation is provided only for any lapse of time. This method is suitable when the units of production are identical or uniform. To be more clear about this method, consider the following example;

Suppose the cost of a machine used for manufacturing products is Rs.1,00,000. Its capacity is to manufacture 2,00,0000 units during its entire life and has no scrap value. On dividing the cost of the machine with estimated output, we arrive at a figure of Re.0.50 per unit, which is known as depreciation rate per unit. The use of this method for charging depreciation on output will overcome the problem created by wide fluctuations, in production activity and charging depreciation on the time basis.

Question 4

What is an idle capacity? What are the costs associated with it? How are these treated in product costs?

Answer

Idle Capacity: Idle capacity is that part of the capacity of a plant, machine or equipment which cannot be effectively utilised in production. In other words, it is the difference between the practical or normal capacity and capacity of utilisation based on expected sales. For example, if the practical capacity of production of a machine is to the tune of 10,000 units in a month, but is used only to produce 8,000 units, because of market demand of the product, then in such a case, 2,000 units will be treated as the idle capacity of the machine.

The idle capacity may arise due to lack of product demand, non-availability of raw-material, shortage of skilled labour, absenteeism, shortage of power, fuel or supplies, seasonal nature of product, etc

Idle Capacity Costs: Costs associated with idle capacity are mostly fixed in nature. These include depreciation, repairs and maintenance charges, insurance premium, rent, rates, management and supervisory costs. These costs remain unabsorbed or unrecovered due to under-utilisation of plant and service capacity. Idle capacity cost can be calculated as follows:-

$$\text{Idle capacity cost} = \frac{\text{Aggregate overhead related to plant}}{\text{Normal plant capacity}} \times \text{Idle Capacity}$$

Treatment of Idle capacity cost: Idle capacity costs can be treated in product costing, in the following ways:

(i) If the idle capacity cost is due to unavoidable reasons such as repairs, maintenance, change over of job, etc, a supplementary overhead rate may be used to recover the idle capacity cost. In this case, the costs are charged to the production capacity utilised.

(ii) If the idle capacity cost is due to avoidable reasons such as faulty planning, power failure etc., the cost should be charged to profit and loss account.

(iii) If the idle capacity cost is due to seasonal factors, then, the cost should be charged to the cost of production by inflating overhead rates.

Question 5

Explain what is meant by Cost Apportionment and Cost Absorption. Illustrate each with two examples. Discuss the methods of cost absorption and state which method do you consider to be the best and why

Answer

Cost apportionment is the process of charging expenses in an equitable proportion to the various cost centres or departments. This describes the allotment of proportions of overhead to cost centres or departments. It is carried out in respect of those items of cost which cannot be allocated to any specific cost centre or department. For example, the salary of general manager cannot be allocated wholly to the production department, as he attends in general to

all the departments. Therefore, some logical basis is selected and adopted for the apportionment of such type of expenses over various departments. Likewise, factory rent can be apportioned over the production and service departments on the basis of the area occupied by each.

Cost absorption, is the process of absorbing all overhead costs allocated to or apportioned over particular cost centre or production department by the units produced; for example ,the manufacturing cost of lathe centre is absorbed by a rate per lathe hour. Manufacturing costs of groundnut crushing centre can be absorbed by using a Kg. of groundnut oil produced as the basis. The purpose behind the absorption is that expenses should be absorbed in the cost of the output of the given period. For overhead absorption some suitable basis has to be adopted.

Methods of Cost Absorption: Various methods of cost absorption can be grouped under the following three heads:

(i) Production unit method.

(ii) Percentage method e.g.

  (a) Percentage of direct material cost.

  (b) Percentage of direct wages.

  (c) Percentage of prime cost.

(iii) Hourly rate method e.g.

  (a) Direct labour hour rate.

  (b) Machine hour rate.

Production unit method: To absorb the overhead costs by this method either a pre-determined or actual rate of overhead absorption is calculated, by dividing the cost to be absorbed by the number of units produced or expected to be produced. This method is the simplest one. But its usefulness is limited normally to those situations where only one product is produced.

Percentage of direct material cost method: Under this method, overheads are recovered on the basis of a pre-determined or actual rate, which is computed as follow:-

$$\frac{\text{Expected (or Actual) Overhead}}{\text{Expected (or Actual) direct material cost}} \times 100$$

This method is not used commonly because of the following limitations:

1. Material prices fluctuate quite often and this phenomenon leads to high or low charges in respect of overhead, even though overheads figures remain unchanged. This vitiates comparison of cost of production from period to period

2. Most of the overhead expenses vary with time. Thus, a job requiring cheap materials but longer period of processing should bear more for overheads as compared to a job which

necessitates expensive materials but shorter period of processing. But the use of direct material cost bases totally ignores the time considerations.

Percentage of direct wage method: This method is similar to the previous one except that here direct wages are taken for ascertaining the recovery rate. It is useful where production is uniform, all the workers employed earn more or less the same hourly rate and labour is predominant. The main advantages of this method are:

(1) It is simple to operate and understand.

(2) It given consideration to time element.

(3) Labour rates fluctuate less frequently than the rate of materials.

The application of the direct wage method does not give correct results under the following conditions:

(a) Where major work is done by machines and the workers merely act as attendants.

(b) Where same work is done on different jobs by workers with different rate of pay and also the highly paid workers cannot increase their output/input ratio. In such a case if, overhead is recovered on the basis of direct wages it will not only cost more in labour but also involve large share of overhead expenses as compared to those performed by low paid workers. But in fact highly paid workers take less time and therefore make use of less resources, supplies etc., so that share of overhead should be rather less.

Percentage of prime cost method: This method is infact a combination of direct material and the direct wage cost basis. The rate of absorption here is calculated by using the following formula:

$$\frac{\text{Total overhead cost}}{\text{Total prime cost}} \times 100$$

This method is very simple and takes into account both material and labour costs to calculate rate of absorption. The main disadvantage of using this method is that it givens equal weightage to both material and labour.

Direct labour hour rate: This is the most equitable method of charging the manufacturing overhead to production where labour hours are the most important element of cost. Under this method, labour hours are taken as a basis for the overhead absorption. It can be calculated by dividing the overheads to be absorbed by the labour hours expended or expected to be expended. To operate this method successfully additional records of labour must be maintained to get the number of direct labour hours by departments and product.

The labour hour rate can be adopted under the following circumstances:

(a) Where production is not uniform and, where a percentage method would not give accurate results.

(b) Where labour is the main factor of production.

Machine hour rate: This is one of the most scientific methods for the absorption of factory overheads. Machine hour rate means the cost or expenses incurred in running a machine for

one hour. This rate is calculated by dividing the amount of factory overheads concerning a machine the number of machine hours.

It is difficult to name a single method which is suitable for the absorption of overhead costs under different circumstances. However, direct labour hour rate or machine hour rate are considered as best methods specially in those very manufacturing units in which labour or machine is a predominant factor.

Question 6

State the objectives of codification of overheads. Enumerate with examples the different methods of coding and suggest a suitable method for a large organization.

Answer

Coding is a technique of intelligently describing in number/letters or a combination of both, the length description of numerous cost accounting heads for ease of recording and controlling of the cost data generated. This is usually accomplished by formulating a coding system.

Objective of codification: The important objectives of codification of overheads are as follows:

(1) To group items of similar nature, which are amenable to apportionment of overhead expenses on the same basis.

(2) To facilitate the task of allocation and apportionment of overheads over different departments or cost centres.

(3) To carry out an analysis of overhead expenses for control purposes.

(4) To reduce the task of maintaining a huge number of accounts.

(5) To help the task of machine accounting systems in a large organization.

Methods of codification: The important methods of codification of overheads are as follows:

1. *Straight Numbering Systems:* Under this system each type of expenditure is allotted a fix number; for example:

   Standing order number: 10 for indirect material.

   Standing order number: 11 for indirect labour.

2. *Number blocks:* According to this method a block number is generally earmarked to indicate the major heads of expenditure e.g. 1-50 for service labour ; 51-100 for maintenance; 100-150 for fringe benefits etc.

3. *Combination of symbols and Numbers:* Under this method a combination of symbol/alphabet and a number is used to represent a code. Here alphabet stands for the main head of the expenditure and the number represents the concerned department. For

example in the code R1 and R2 , R stands for repair and '1'and '2'stands for building and machines respectively, in other words:

R1- Repairs of buildings

R2- Repairs of machines.

4. *Field method numerical codes:* Under this method each code number consist of nine digits. The first two digits indicate the nature of expenses viz. variable or fixed. The next three digits indicate head of expenses ; the next two digits stand for the analysis for expenses, and last two digits indicate the cost centre, where expenses have been incurred. For example in code 10/120/01/05; 10 stands for variable cost; 120 for idle time; 01 for waiting of materials and 05 for lathe shop or;

Code	particulars
10/120/01/05	Variable/Idle Time/Waiting for material/Lathe shop

5. *The Mnemonic method:* Under this method the letters alphabets are used as codes to help the memory. For example M.S.B. may be used as a code for Mild Steel Bar.

Out of the five different methods discussed above for the purpose of codification of overhead expenses; the field method is considered to be most suitable for a large size business organization. The main plus point of this method is that a code given to an item of expense represents four of its characteristics (Ref. to example under method 4). Also large number of items of overhead expenses can be accommodated under this type of codification. Lastly this method is easy to operate in case mechanical system of accounting is in vogue in the concern.

Question 7

Explain what do you understand by the terms stores overheads. Cite three example of stores overheads. Discuss the methods of treatment of stores overhead in cost accounts and state the method which you consider to be good.

Answer

Overheads refer to indirect costs i.e., costs which cannot be directly attributed to any particular cost unit (jobs, work, order, process, product, etc.). Stores overheads include all those expenditure(excluding material cost) which are incurred by stores department to perform its functions such as purchase, storage and issues. The materials purchased, stored and issued by the stores department may be used by the production department as well as by the service departments. Three examples of stores overheads are:

(i) rent of store – room,

(ii) salaries and wages of stores staff and workers,

(iii) freight, insurance, carriage etc.

Stores overheads are collected under separate standing order number. They are treated as a part of factory overheads and are charged to various production and non - production

departments on the basis of the extent of service received by each departments. The following methods are generally used for recovering the stores overheads.

(i) Number of stores - requisitions.

(ii) Value of material requisitioned.

(iii) Standard pre-determined rate.

(i) *Number of stores requisitions:* According to this method the stores overheads are charged to different departments on the basis of number of requisitions. For example, if during a given period, 'A' department has issued two requisitions and 'B' department has issued 3 requisitions and these are the only two departments using the services of the stores department, the total stores overheads will be charged to the two departments in the ratio of 2:3.

(ii) *Value of material requisitioned:* Under this method, stores overheads are apportioned over different departments by using the basis of the value of the material issued. Under this method a department is charged a higher proportion of stores overheads if the value of the material issued is proportionately higher though the number of requisitions may be less. This method of charging overheads to different departments is not considered satisfactory. It does not give due weightage to those factors which affect overheads e.g., number of requisitions, inward transportation expenses, weight of different items, etc

(iii) *Standard pre-determined rate:* Under this method a standard overheads recovery rate is ascertained for the recovery of stores overheads. In the ascertainment of standard overheads recovery rate due consideration is given for the efforts involved in purchasing, storing and issuing different materials requisitioned by different departments. This method of stores overhead recovery enables the firm to use the same rate throughout a financial year.

Out of the three methods discussed above, the pre-determined stores overheads recovery rate is considered the best because it gives due weightage to all such factors which affect the stores overhead. Another reason which accounts for its superiority over the other methods is that it ensures uniformity in stores overheads recovery rate throughout the year. It is also free from seasonal fluctuations. If also enable the effective control over stores overheads by comparing stores overheads recovered and stores overheads actually incurred.

Question 8

In a manufacturing company where costing is done with a view to fix prices, state whether and, if so, to what extent the following items are includible in cost .

(i) Interest on borrowing

(ii) Bonus and gratuity

(iii) Depreciation on plant and machinery .

Answer

The Cost Accountant makes no decision on pricing . Pricing is the domain of top management and sometimes sales management . The cost accountant only helps management in providing cost data and also determines the financial effects of fixing prices or the change in prices on the profitability of the undertaking . Here the cost accountant is required to analyse whether , and if so the extent to which – interest on borrowing; bonus and gratuity ; depreciation on plant and machinery – be included as elements of cost.

(i) Interest on borrowings: There is a wide difference of opinion among accountants about the treatment of interest on borrowing in cost accounts. Some favour its inclusion in the Cost Accounts, while others hold that interest, being a financial charge, should not be included in Cost Accounts.

The supporters of interest inclusion give the following argument:

1. Interest is the cost of the borrowed capital as wages are rewards for the labour. Both are factors of production and as such no distinction should be made between the remuneration of these two factors.
2. Comparison of cost is rendered difficult if no interest is taken in business where raw materials in different states of readiness are used.
3. Without inclusion of interest, profits on different jobs requiring different amounts of capital or requiring different periods for completion are not comparable.

The other viewpoint, based on interest being a financial charge, is not an element of cost of production whereas cost accounting is concerned with determination of true cost of production.

But the proposition for consideration is whether interest on borrowing should be taken into costing for the purpose of price determination or not. In price determination effort should be made to accumulate as much costs as can be attributable to the production activity, incurred directly or indirectly, to narrow down the risk of wrong pricing decision. Accordingly, it is advisable that interest on borrowings attributable to production process should be taken in the cost statement meant to help the pricing decision. Care should be taken to see that no interest on borrowings for asset acquisition is included in cost account, for the purpose.

(ii) Bonus and gratuity: Bonus under the payment of Bonus Act is to be paid compulsorily to the workers although the amount of bonus may vary with amount of profit earned. A minimum bonus of 8.33% is, however, payable irrespective of profit or loss earned by the concern. The amount of bonus, therefore, may be included in a direct labour cost to the extent of the minimum bonus, as the same is payable even in a loss situation. Any amount paid as bonus in excess of the minimum may be considered as an appropriation of profit. However, bonus linked with productivity is definitely a part of the overhead cost.

So far as gratuity is concerned, it is indeed directly linked with the wages and is not by any means related to the profits. Accordingly, it should be treated as an element of cost:

(iii) Depreciation on plant and machinery: Depreciation on fixed assets represents the consumption of the value of the concerned assets in the process of operations. This consumption, is therefore an indirect cost of the production and operations. Without this, true cost of production cannot be obtained. Hence, depreciation charged in the accounts is considered as includible as an element of cost.

Question 9

(a) What do you understand by codification of overheads?

(b) What are the objectives of codification?

(c) *List down the various methods of codification (you need not elaborate).*

Answer

(a) Codification of overheads:

It is a technique of intelligently describing in number/letters or a combination of both. The lengthy description of numerous Cost Accounting heads for ease of recording and controlling of the cost data generated. Codes are developed after accepting/developing a coding system.

(b) Objectives of codification:

(i) To group items of similar nature which are amenable to apportionment of overhead expenses on the same basis.

(ii) To facilitate the task of allocation and apportionment of overheads over different departments or cost centres.

(iii) To carry out an analysis of overhead expenses for control purposes.

(iv) To reduce the task of maintaining a huge number of accounts.

(v) To help the task of machine accounting systems in large organization.

(c) Methods of codification:

(i) Straight numbering system.

(ii) Number blocks.

(iii) Combination of letters and numbers.

(iv) Field method of numerical code.

(v) Mnemonic method.

Question 10

How would you deal the following items in the cost accounts of a manufacturing concern?

(a) Research and Development cost

(b) Packing Expenses

(c) *Fringe Benefits*

(d) *Expenses on Removal and Re-erection of Machinery.*

Answer

(a) Research and Development Cost:

Research and Development Cost is the cost/expense incurred for searching new or improved products, production method/techniques or plants/ equipments. Research Cost may be incurred for carrying basic or applied research. Both basic and applied research relates to original investigation to gain from new scientific or technical knowledge and understanding, which is not directed towards any specific practical aim (under basic research) and is directed towards a specific practical aim or objective(under applied research).

Treatment in Cost Accounts

Cost of Basic Research (if it is a continuous activity) be charged to the revenues of the concern. It may be spread over a number of years if research is not a continuous activity and amount is large.

Cost of applied research, if it relates to all existing products and methods of production then it should be treated as a manufacturing overhead of the period during which it has been incurred and absorbed. Such costs are directly charged to the product, if it is solely incurred for it.

If applied research is conducted for searching new products or methods of production etc., then the research costs treatment depends upon the outcome of such research. For example. If research findings are expected to produce future benefits or if it appears that such findings are going to result in failure then the costs incurred may be a mortised by charging to the Costing Profit and Loss Accounts of one or more years depending upon the size of expenditure. If research proves successful, then such costs should be charged to the concerned product.

Development Costs, begins with the implementation of the decision to produce a new or improved product or to employ a new or improved method. The treatment of development expenses is same as that of applied research.

(b) Packing Expenses:

It includes the expenses incurred on wrapping, tying, bottles, boxes, containers or bags etc. In Cost Accounts they are treated as follows:

(i) It is treated as a direct material cost in the case of those products which cannot be sold without the use of a packing. For example ink-pot ; Bread; paste etc.

(ii) It may be treated as distribution overhead if packing expenses are incurred to facilitate the transportation of finished products.

(iii) It may be treated as advertisement cost and included in selling overheads if it is incurred for advertisement to make the product attractive.

(c) Fringe Benefits:

Additional Benefits paid to the employees of a concern and are not related to the direct efforts of the employees, are called fringe benefits. They include holiday pay; leave pay; employer's contribution to provident fund; gratuity and pension schemes; state insurance; medical benefits; subsidised facility etc.

Expenditure incurred on fringe benefits in the case of factory workers should be treated as factory overheads and are apportioned among all the production and service departments on the basis of the number of workers in each department.

Fringe benefits to office and selling and distribution staff should be treated as administration and selling and distribution overheads respectively and are recovered accordingly.

(d) Expenses on Removal and Re- erection of Machinery:

Expenses are sometime incurred on removal and re-erection of machinery in factories. Such expenses may be incurred due to factors like change in the method of production; an addition or alteration in the factory building, change in the follow of production, etc. All such expenses are treated as production overheads. When amount of such expenses is large, it may be spread over a period of time.

If such expenses are incurred due to faulty planning or some other abnormal factor, then they may be charged to Costing Profit and Loss Account.

Question 11

What do you understand by the term 'pre-determined rate of recovery of overheads'? What are the bases that are usually advocated for such pre-determination? How do over – absorption and under-absorption of overheads arise and how are they disposed off in Cost Accounts?

Answer

The term 'pre-determined' rate of recovery of overheads' refers to a rate of overhead absorption. It is calculated by dividing the budgeted overhead expenses for the accounting period by the budgeted base for the period. This rate of overhead absorption is determined prior to the start of the activity; that is why it is called a 'pre-determined rate'. The use of the pre-determined rate of recovery of overheads enables prompt preparation of cost estimates and quotations and fixation of sales prices. For prompt billing on a provisional basis before completion of work, as for example in the case of cost plus contracts, pre-determined overhead rates are particularly useful.

Bases Available: The bases available for computing 'pre-determined rate of recovery of overheads' are given below:-

1. Rate per unit of output
2. Direct labour cost method

3. Direct labour hours method
4. Machine hour rate method
5. Direct material cost method
6. Prime cost method.

The choice of a suitable method for calculating 'pre-determined rate of recovery of overhead, depends upon several factors. Some important ones are- type of industry, nature of product and processes of manufacture, nature of overhead expenses, organisational set-up, policy of management etc.

Reason for over/under absorption of overheads: Over-absorption of overheads arises due to one or more of the following reasons.

(ii) Improper estimation of overhead.

(iii) Error in estimating the level of production.

(iv) Unanticipated changes in the methods or techniques of production.

(v) Under-utilisation of the available capacity.

(vi) Seasonal fluctuations in the overhead expenses from period to period.

Methods for absorbing under/over absorbed overheads: The over-absorption and under-absorption of overheads can be disposed off in cost accounting by using any one of the following methods:

(i) Use of supplementary rates

(ii) Writing off to costing profit & loss Account

(iii) Carrying over to the next year's account

(i) *Use of supplementary rates:* This method is used to adjust the difference between overheads absorbed and overhead actually incurred by computing supplementary overhead rates. Such rates may be either positive or negative. A positive rate is intended to add the unabsorbed overheads to the cost of production. The negative rate, however corrects the cost of production by deducting the amount of over-absorbed overheads. The effect of applying such a rate is to make the actual overhead get completely absorbed.

(ii) *Writing off to costing profit & loss account:* When over or under-absorbed amount is quite negligible and it is not felt worthwhile to absorb it by using supplementary rates, then the said amount be transferred to costing profit & loss Account. In case under-absorption of overheads arises due to factors like idle capacity, defective planning etc., it may also be transferred to costing profit & loss Account.

(iii) *Carrying over the next year's account:* Under this method the amount of over/under absorbed overhead is carried over to the next period. This method is not considered desirable as it allows costs of one period to affect costs of another period. Further, comparison between one period and another is rendered difficult. Therefore, this method

is not proper and has only a limited application. However, this method may be used when the normal business cycle extends over more than one year, or in the case of a new project, the output is low in the initial years.

Question 12

(a) What do you mean by the term under/over absorption of production overhead? How does it arise? How is it treated in cost account?

(b) In a factory, overhead of a particular department are recovered on the basis of Rs. 5 per machine hour. The total expenses incurred and the actual machine hours for the department for the month of August were Rs. 80,000 and 10,000 hours respectively. Of the amount of Rs. 80,000, Rs. 15,000 became payable due to an award of the Labour Court and Rs. 5,000 was in respect of expenses of the previous year booked in the current month (August). Actual production was 40,000 units of which 30,000 units were sold. On analysing the reasons, it was found that 60% of the under absorbed overhead was due to defective planning and the rest was attributed to normal cost increase. How would you treat the under absorbed overhead in the cost accounts?

Answer

(a) Production Overheads are usually applied to production on the basis of predetermined rates .The pre-determined rates may be based on estimated costs. The amount of expenses actually incurred and the amount of overhead applied to production will seldom be the same. Some difference is inevitable.

If the actual expenses fall short of the amount applied to production, there is said to be an over absorption of production overheads. If the actual expenses exceeds the amount applied to production, there is a case of under absorption.

The under/over absorption of overheads arise due to the following reasons:

(1) Error in estimating overhead expenses.

(2) Error in estimating the level of production.

(3) Unanticipated changes in methods of production.

(4) Seasonal fluctuations in the overhead expenses from period to period.

Treatment of under/over absorption in Cost Accounts

Under/overabsorbed overheads may be treated in Cost Accounts by adopting the following methods:

(i) Use of supplementary rates : In case, the amount of under or over absorbed overheads is large the cost of the jobs may be adjusted by means of a supplementary rates The supplementary rate here is determined by dividing the amount of under or over absorbed overhead by the actual base. Under – absorption of overheads is set right by increasing the rate of overhead absorption to the extent of supplementary rate. Whereas in the case of over- absorption of overheads, the rate of overhead absorption is reduced to the extent of supplementary rate.

(ii) **Write off to Costing Profit and Loss Account:** When the amount of under-or-over absorbed overheads is small the simple method is to write it off to the Costing Profit and Loss Account.

(iii) **Absorption in the accounts of subsequent years:** The amount of under or over absorbed overheads may be carried over as a deferred charge of deferred credit to the next accounting year. This may be done by transferring the amount either to a Suspense or Overhead Reserve Account.

(b) Under-absorbed Overhead Expenses during the month of August:

		Rs.
Total Expenses incurred in the month of August		80,000
Less: The amount paid according to labour court award		
(Assumed To be non- recurring)	Rs. 15,000	
Expenses of previous year	Rs. 5,000	20,000
Net overhead expenses incurred for the month		60,000
Overhead recovered for 10,000 hours @ Rs. 5/- per hour		50,000
Under absorbed overheads		10,000

Treatment of under – absorbed overhead in the Cost Accounts

It is given in the question that 40,000 units were produced out of which 30,000 units were sold. It is also given that 60% of the under-absorbed overhead was due to defective planning and the rest was attributed to normal cost increase.

		Rs.
1.	60 percent of under absorbed overhead is due to defective planning. This being abnormal, should be debited to Profit and Loss A/c (60% of Rs. 10,000)	6,000
2.	Balance 40 percent of under-absorbed overhead should be distributed over, Finished Goods and Cost of Sales by supplementary rate (40% of Rs. 10,000)	40,000
		10,000

Rs.4,000 may be distributed over Finished Goods and Cost of Sales as follows;

Finished Goods	*Rs. 1,000
Cost of Sales	*Rs. 3,000

***Working notes**

- Under absorbed overhead :Rs 4,000
- Units produced : 40,000
- Rate of Under- absorbed overhead recovery — Re. 0.10 per unit
- Amount of under–absorbed overheads charged to finished goods (10,000 ×0.10P) — Rs. 1,000
- Amount of under–absorbed overheads charged to Cost of sales (30,000 ×0.10P) — Rs. 3,000

Question 13

(a) Distinguish between allocation, apportionment and absorption of overheads.

(b) A departmental store has several departments. What bases would you recommend for apportioning the following items of expense to its departments

(1) Fire insurance of Building.

(2) Rent

(3) Delivery Expenses.

(4) Purchase Department Expenses.

(5) Credit Department Expenses.

(6) General Administration Expenses.

(7) Advertisement.

(8) Sales Assistants Salaries.

(9) Personal Department expenses.

(10) Sales Commission

Answer

(a) Distinguish between Allocation, Apportionment and Absorption of Overheads:

Allocation: According to ICMA terminology: " the allotment of whole items of cost to cost centres or cost units", is known as allocation.

Apportionment: "The allotment to two or more cost centres of a proportions of common items of cost on the estimated basis of benefit received" is known as apportionment.

Absorption of Overheads : It is defined as the process of absorbing all overhead costs allocated or apportioned over particular cost centre or production department by the units produced.

Allocation of cost involves the process of charging total expenditure to cost centres or cost units while the apportionment of overheads involves the process of charging expenditures to cost centres or cost units in the specified proportions.

Absorption of overheads takes place only after the allocation and apportionment of overhead expenses. In other words , the overhead costs are either allocated or apportioned over different cost centres r cost units and afterwards they are absorbed basis by the output of the same cost centres.

(b)	Items of expenses	Basis For apportioning
(1)	Fire Insurance of Building.	Floor Area
(2)	Rent	Floor Area
(3)	Delivery Expenses.	Volume or Distance or Weight
(4)	Purchase department Expenses	No. of Purchase order/Value of Purchases
(5)	Credit Department Expenses.	Credit Sales Value
(6)	General Administration Expenses.	Works cost
(7)	Advertisement.	Actual sales
(8)	Sales Assistants Salaries.	Actual/Time devoted
(9)	Personal Department expenses.	No. of Employees
(10)	Sales Commission	Actual

Question 14

Define administration overheads and state briefly the treatment of such overheads in Cost Accounts. *(Nov. 1996, 4 marks)*

Answer

Definition of Administration Overhead: These are costs of formulating the policy, directing the organisation and controlling the operation of an undertaking. These are not related directly to production activity or function. In other words, all expenses, incurred on policy formulation, direction, control, office administration and business management are included in administration overheads.

Treatment of Administrative Overheads in Cost Accounting

(i) *Charge to Costing Profit and Loss Account:* According to this method administrative overheads should be treated as fixed cost as they are concerned with the formulation of policy. Hence these overheads should be transferred to the Costing Profit and Loss Account.

(ii) *Apportionment between Production and Selling and Distribution:* According to this method, it is assumed that administrative overheads are incurred both for production and for selling and distribution. Therefore these overheads should be divided on some equitable basis between production and selling and distribution activity.

(iii) *Treat as a separate element of total cost:* Here administration overheads are considered as a cost of a distinct and identifiable operation of the organisation necessary to carry on its activity. Therefore these overheads are recovered separately on some equitable basis which may be on cost or sales basis.

Question 15

Enumerate the arguments for the inclusion of interest on capital in cost accounts.

Answer

Arguments for the inclusion of interest on capital in cost accounts:

1. Interest is the cost of capital as wages are the reward for labour. Both are factors of production and, therefore should not be treated differently in cost accounts. While determining the total cost, interest like wages should also be included in the cost of production.
2. The exclusion of interest from cost accounts, particularly in businesses where raw material is used in different states of readiness would distort costs and render their comparison a difficult one.
3. Profit on different jobs/ operations requiring different periods for completion may not be comparable if interest on capital is not included in their total cost,
4. Sometime exclusion of interest cost may lead the management to take wrong decisions.
5. The significance of time value of money is recognized only when interest is treated as an element of cost.

Question 16

What is blanket overhead rate? In which situations, blanket rate is to be used and why?

(May 1999, 3 marks)

Answer

Blanket overhead rate is one single overhead absorption rate for the whole factory. It may be computed by using the following formulae:

$$\text{Blanket overhead rate} = \frac{\text{Overhead costs for the whole factory}}{\text{* Total units of the selected base}}$$

*** The selected base can be the total output; total labour hours; machine hours etc.**

Situation for using blanket rate:

The use of blanket rate may be considered appropriate for factories which produce only one major product on a continuous basis. It may also be used in those units in which all products utilise same amount of time in each department. If such conditions do not exist, the

use of blanket rate will give misleading results in the determination of the production cost , specially when such a cost ascertainment is carried out for giving quotations and tenders.

Question 17

What is 'Idle Capacity '? How should this be treated in cost accounts?

(May 1997, 6 marks)

Answer

Idle Capacity:

It is that part of the practical capacity which cannot be utilised due to lack of demand, non availability of materials, skilled labour, shortage of power, fuel or supplies, seasonal nature of product and lower sales expectancy. Idle capacity in fact is the difference between the practical capacity and the capacity based on sales expectancy. In brief, idle capacity is unused capacity of a plant, equipment or department which cannot be used gainfully. It usually arises due to factors which the management of a business concern considers beyond its control.

Idle capacity is associated with costs which are represented mostly by fixed charges such as depreciation, repairs and maintenance, insurance premium, rent, rates, management supervisory costs, which cannot be absorbed or recovered due to under utilisation of plant capacity.

Treatment of Idle Capacity in cost accounts:

Idle capacity costs may be normal or abnormal. These costs may be treated in the following ways in cost accounts.

(i) Normal Idle capacity cost due to unavoidable reasons may be included in works overheads and be absorbed into the cost of production either by inflating the overhead rate or by means of a supplementary overhead rate.

(ii) Abnormal Idle Capacity cost due to avoidable reasons such as lack of proper planning and control should be charged to costing profit and loss account.

(iii) Idle Capacity cost due to trade depression is abnormal in nature and thus it should be charged to costing profit and loss account.

Question 18

Discuss the step method and reciprocal service method of secondary distribution of overheads. (November, 2004, 4 marks)

Answer

Step method and Reciprocal Service method of secondary distribution of overheads

Step method: This method gives cognisance to the service rendered by service department to another service dep't, thus sequence of apportionments has to be selected. The sequence here begins with the dep't that renders service to the max number of other service dep't. After this, the cost of service dep't serving the next largest number of dep't is apportioned.

Reciprocal service method: This method recognises the fact that where there are two or more service dep't, they may render service to each other and, therefore, these inter dep't services are to be given due weight while re-distributing the expense of service dep't. The methods available for dealing with reciprocal servicing are:

- Simultaneous equation method
- Repeated distribution method
- Trial and error method

Question 19

Discuss the treatment of under absorbed and over-absorbed factory overheads in Cost Accounting. *(May, 2004,4 marks)*

Answer

Treatment of under absorbed and over absorbed factory overheads in cost accounting.

Factory overheads are usually applied to production on the basis pre-determined rate

$$= \frac{\text{Estimated normal overheads for the period}}{\text{Budgeted No. of units during the period}}$$

The possible options for treating under / over absorbed overheads are

- Use supplementary rate in the case of substantial amount of under / over absorption
- Write it off to the costing profit & loss account in the event of insignificant amount / or abnormal reasons.
- Carry toward to accounting period if operating cycle exceeds one year.

Question 20

Discuss the problems of controlling the selling and distribution overheads

(May, 2004, 3 marks)

Answer

Problems of controlling the selling & distribution overheads are

(i) The incidence of selling & distribution overheads depends on external factors such as distance of market, nature of competition etc. which are beyond the control of management.

(ii) They are dependent upon customers' behaviour, liking etc.

(iii) These expenses are of the nature of policy costs and hence not amenable to control.

The above problems of controlling selling & distribution overheads can be tackled by adopting the following steps:

(a) Comparing the figures of selling & distribution overhead with the figures of previous period.

(b) Selling & distribution overhead budgets may be used to control such overhead expenses by making a comparison of budgetary figures with actual figures of overhead expenses, ascertaining variances and finally taking suitable actions,

(c) Standards of selling & distribution expenses may be set up for salesmen, territories, products etc. The laid down standards on comparison with actual overhead expenses will reveal variances, which can be controlled by suitable action.

Question 21

Distinguish between cost allocation and cost absorption

(November, 2001, 2 marks)

Answer

Cost allocation and Cost absorption:

Cost allocation is the allotment of whole item of cost to a cost centre or a cost unit. In other words, it is the process of identifying, assigning or allowing cost to a cost centre or a cost, unit.

Cost absorption is the process of absorbing all indirect costs or overhead costs allocated to apportioned over particular cost center or production department by the units produced.

Question 22

Discuss in brief three main methods of allocating support departments costs to operating departments. Out of these three, which method is conceptually preferable.

(November, 1999, 4 marks)

Answer

The three main methods of allocating support departments costs to operating departments are:

(i) *Direct re-distribution method:* Under this method, support department costs are directly apportioned to various production departments only. This method does not consider the service provided by one support department to another support department.

(ii) *Step method:* Under this method the cost of the support departments that serves the maximum numbers of departments is first apportioned to other support departments and production departments. After this the cost of support department serving the next largest number of departments is apportioned. In this manner we finally arrive on the cost of production departments only.

(iii) *Reciprocal service method:* This method recognises the fact that where there are two or more support departments they may render services to each other and, therefore, these inter-departmental services are to be given due weight while re-distributing the expenses of the support departments. The methods available for dealing with reciprocal services are:

(a) Simultaneous equation method

(b) Repeated distribution method

(c) Trial and error method.

The reciprocal service method is conceptually preferable. This method is widely used even if the number of service departments are more than two because due to the availability of computer software it is not difficult to solve sets of simultaneous equations.

Question 23

Write short notes on Chargeable Expenses *(November 1994, 4 marks)*

Answer

Chargeable Expenses: These are the expenses which can be charged directly to jobs, products, process, cost centers or cost units. These are also known as direct expenses. Depending on the situation, the same item of expense may be treated as a chargeable expense or an indirect cost. For example, the rent charges of a machine specifically hired to complete a particular job will be a direct charge on the job. But if the same machine is used for various purposes, then the rent charges will be treated as an indirect cost and are apportioned to concerned cost centers on an equitable basis. The following may also be treated as chargeable expenses in relation to a product or job:

1. Cost of patents.
2. Hire charge in respect of special machinery or plant.
3. Architects, surveyors and other consultant's fees.

4. Travelling expenses to site.
5. Freight inward on special material.

Question 24

Explain Single and Multiple Overhead Rates. *(November, 2000, 4 marks)*

Answer

Single and Multiple Overhead Rates:

Single overhead rate: It is one single overhead absorption rate for the whole factory.

It may be computed as follows:

$$\text{Single overhead rate} = \frac{\text{Overhead costs for the entire factory}}{\text{Total quantity of the base selected}}$$

The base can be total output, total labour hours, total machine hours, etc.

The single overhead rate may be applied in factories which produces only one major product on a continuous basis. It may also be used in factories where the work performed in each department is fairly uniform and standardized.

Multiple overhead rate: It involves computation of separate rates for each production department, service department, cost center and each product for both fixed and variable overheads. It may be computed as follows:

$$\text{Multiple overhead rate} = \frac{\text{Overhead allocated/appportioned to each department/cost centre or product}}{\text{Corresponding base}}$$

Under multiple overhead rates, jobs or products are charged with varying amount of factory overheads depending on the type and number of departments through which they pass. However, the number of overhead rates which a firm may compute would depend upon two opposing factors viz. the degree of accuracy desired and the clerical cost involved.

Question 25

What is notional rent of a factory building? Give one reason why it may be included in cost accounts. *(November, 1995, 2 marks)*

Answer

Notional Rent: It is a reasonable charge raised in the cost accounts for the use of owned premises. One reason for the use of such a nominal charge is to enable comparison between the cost of items made in factories which are owned and in rented factories. However, it may be noted that in the case of owned factory, cost for the same is accounted for by means of depreciation.

Question 26

How do you deal with the following in cost accounts?

(i) Fringe benefits

(ii) Bad debts. *(November, 1999, 4 marks)*

Answer

Treatment of Cost Accounts

(i) Fringe benefits: the benefits paid to workers in every organisation in addition to their normal wage or salary are known as fringe benefits. They include – Housing facility, children education allowance, holiday pay, leave pay, leave travel concession to home town or any place in India, etc.

Expenditure incurred on fringe benefits in respect of factory workers should be apportioned among all the production and service departments on the basis of the number of workers in each department.

(ii) Bad debts: There is no unanimity among various authors about the treatment of bad debts. Some authors believe that bad debts are financial losses and therefore should not be included in the cost of a particular product or job. Another view is that, bad debts are a part of selling and distribution overhead, especially where they arise in the normal course of trading. Therefore they should be treated in cost accounts in the same way as any other selling and distribution expense.

Question 27

How would you treat the following in Cost Accounts?

(i) Employee welfare costs *(2 marks)*

(ii) Research and development costs *(2 marks)*

(iii) Depreciation *(May, 1996) (2 marks)*

Answer

(i) Employee Welfare Costs: It includes those expenses, which are incurred by the employers on the welfare activities of their employees. The welfare activities on which these expenses are usually incurred may include canteen, hospital, play grounds, etc. These expenses should be separately recorded as Welfare Department Costs. These Costs may be apportioned to production cost centres on the basis of total wages or the number of men employed by them,

(ii) Research and development costs: It is the cost/expense incurred for searching new or improved products, production methods/techniques or plants/equipments. Re– search cost may be incurred-for carrying basic or applied research. Both basic and applied research relates to original investigations to gain from new scientific or technical knowledge and understanding, which is not directed towards any specific practical aim

(under basic research) and is directed towards a specific practical aim or objective (under applied research).

Treatment in Cost Accounts: Cost of Basic Research (if it is a continuous activity) be charged to the revenues of the concern. It may be spread over a number of years if research is not a continuous activity and amount is large.

Cost of applied research, if relates-to all existing products and methods of production then it should be treated as a manufacturing overhead of the period during which it has been incurred and absorbed. Such costs are directly charged to the product, it is solely incurred for it.

If applied research is conducted for searching new products or methods of production etc. then the research costs treatment depends upon the outcome of such research. For example, if research findings are expected to produce future benefits or if it appears that such findings are going to result in failure then the costs incurred may be amortised by charging to the Costing Profit and Loss Account of one or more years depending upon the size of expenditure. If research proves successful, then such costs will be charged to the concerned product.

Development Costs begins with the implementation of the decision to produce a new or improved product or to employ a new or improved method. The treatment of development expenses is same as that of applied research.

(iii) Depreciation: It represents the fall in the asset value due to its use, wear and tear and passage of time. Depreciation is an indirect cost of production and operations. It is an important element of cost and without this true cost of production cannot be obtained. In costing; depreciation on plant and machinery is normally treated as part of the factory overheads.

Question 28

Write a note on 'classification', 'allocation' and 'absorption' of overheads. How does it help in controlling overheads? (May, 1998, 5 marks)

Answer

Classification of overheads:

It, means determination of categories, classes or groups in which overhead costs may he sub-divided.

Usually, overhead costs are classified under three broad categories viz, Factory Overheads; Office and administrative Overheads and Selling and distribution Overheads.

Factory overheads represent all those indirect costs that are incurred in the manufacturing process. For example, consumable stores, factory rent, depreciation of plant, factory building, repairs and maintenance.

Office and administrative overheads represent costs which are associated with the administration and maintenance of the office.

Selling and distribution overheads are the expenses incurred for selling and distribution of products. It includes salaries of sales staff and commission; sales-promotion expenses; advertising expenses, warehousing costs etc.

Allocation of overheads:

It refers to the allotment of whole items of overhead cost to cost centres or cost units. In other words, allocation of overhead means the allotment of the whole, undivided items of expense to a particular department or cost centre. For example, departmental salaries directly related to various departments are allocated to them.

Absorption of overheads:

It is defined as the process of absorbing all overhead costs allocated or apportioned over particular cost centre or production department by the units produced.

Absorption of overheads takes place only after the allocation and apportionment of overhead expenses. In other words, the overhead costs are either allocated or apportioned over different cost centres or cost units and afterwards they are absorbed on equitable basis by the output of the same cost centres.

Help rendered in controlling overheads:

The classification, allocation and absorption of overhead costs over different cost centres helps in two ways. Firstly, the overhead costs assigned to cost centres are used for cost control and performance evaluation purposes. These assigned costs are periodically totaled and listed on performance report which also has the figures of budgeted costs. Differences between budgeted and actual costs for each item of expenditure are highlighted in the performance reports and provide feedback information for performance evaluation and cost control purposes. Secondly, the accumulated production cost centre overhead, costs are assigned in the second stage of the procedure to products to satisfy financial accounting requirements for inventory valuation.

Question 29

Distinguish between fixed and variable overheads.

Answer

Fixed and Variable Overheads: Fixed overhead expenses do not vary with the volume of production within certain limits. In other words, the amount of fixed overhead tends to remain constant for volumes of production within the installed capacity of plant. For example, rent of office, salary of works manger, etc.

Variable overhead cost varies in direct proportion to the volume of production. It increases or decreases in direct relation to any increase or decrease in output.

Question 30

How would you treat the idle capacity costs in Cost Accounts? (November, 2001, 4 marks)

Answer

Treatment of idle capacity cost in Cost Accounts:

It is that part of the capacity of a plant, machine or equipment which cannot be effectively utilised in production. The idle capacity may arise due to lack of product demand, no availability of raw-material, shortage of skilled labour, shortage of power, etc. Costs associated with idle capacity are mostly fixed in nature. These costs remain unabsorbed or unrecovered due to under-utilisation of plant and service capacity. Idle capacity costs are treated in the following ways in Cost Accounts.

(i) If the idle capacity cost is due to unavoidable reasons - a supplementary overhead rate may be used to recover the idle capacity cost. In this case, the costs are charged to the production capacity utilised.

(ii) If the idle capacity cost is due to avoidable reasons - such as faulty planning, etc. the cost should be charged to Costing Profit and Loss Account.

(iii) If the idle capacity cost is due to trade depression, etc., - being abnormal in nature the cost should also be charged to the Costing Profit and Loss Account.

Question 31

Select a suitable unit of cost to be used in the following:

(i) Hospital

(ii) City Bus Transport

(iii) Hotels providing lodging facilities (May, 2002, 3 marks)

Answer

	Industry of Product	*Unit of cost*
(i)	Hospital	– Patient bed / day
(ii)	City Bus Transport	– Passenger – km.
(iii)	Hotels providing lodging facilities	– Room / day

Question 32

Discuss the treatment in cost accounts of the cost of small tools of short effective life.

(May, 2002, 4 marks)

Answer

Small tools are mechanical appliances used for various operations on a work place, specially in engineering industries. Such tools include drill bits, chisels, screw cutter, files etc.

Treatment of cost of small tools of short effective life:

(i) Small tools purchased may be capitalized and depreciated over life if their life is ascertainable. Revaluation method of depreciation may be used in respect of very small tools of short effective life. Depreciation of small tools may be charged to:

- Factory overheads
- Overheads of the department using the small tool.

(ii) Cost of small tools should be charged fully to the departments to which they have been issued, if their life is not ascertainable.

Question 33

Ventilators Ltd. wants to stabilize its production throughout the year. The approaches recommended are:

(a) Maintain production at an even pace throughout the year, and get the off-season production stored on the premises.

(b) Maintain production at an even pace but offer dealers a special discount for off-season purchases.

(c) Extend special terms to dealers, but maintain prices at levels that will enable regular movement of goods throughout the year.

Discuss the relative merits and disadvantages of above proposals.

Answer

The relative merits and disadvantages of the three approaches recommended by Ventilators Ltd. are discussed below:

Approach (a)

Merits

(1) It will help the concern to make full and effective use of the plant, manpower and other resources.

(2) It will place the concern in a better position to meet the demand of the customers during the season.

(3) It will help in reducing costs per unit by avoiding shut down costs and maintaining production at an even pace and, thus, score over competitors.

(4) It will help the organisation to deal effectively with unforeseen circumstances such as labour strike or load shedding, etc.

Disadvantages

(1) Storing productions during the off-season will involve extra interest costs because of the need for higher working capital.

(2) In case of seasonal consumer items, production throughout the year may involve a high degree of risk. For example, if a concern dealing in ready-made garments for winter builds up a large inventory, it may suffer heavy losses due to fashion changes.

(3) The firm may face difficulty in meeting its short-term financial commitments due to cash outflows even during the off-season.

Approach (b)

Merits

(1) It involves less working capital in comparison with proposal (a).

(2) It will have a higher inventory turnover ratio, which will account for the increase of profit at a faster rate

(3) It reduces risk of deterioration, obsolescence, etc. Here the risk is, in fact, passed on to the dealers.

(4) It will reduce the inventory carrying cost.

Disadvantages

(1) It may reduce profitability of the firm, depending on the rate of discount to be offered.

(2) Dealers may offer the same lower price during the season as well, affecting sale for the year as a whole.

Approach (c)

Merits

(1) It will ensure a regular product market round the year.

(2) It will provide management ample time to think either of diversifying or entering into allied products.

These two merits are in addition to those stated under (b).

Disadvantages

(1) It gives a low margin of profit

(2) It is really difficult to maintain regular movement of a product having a seasonal demand only.

Proposal (b) appears to be more suitable for achieving the objectives of stabilising the production at an even pace throughout the year but the effect on profits needs to be very carefully seen.

Question 34

Treatment of Interest paid in Cost Account.

Answer

(a) *Treatment of Interest Paid in Cost Accounts:* There is a wide difference of opinion among accountants about the treatment of interest paid on capital in Cost Accounts. Some favour its inclusion in the costs while others say that interest, being a financial charge should not be included in Cost Accounts.

The following are the arguments given in favour of inclusion of interest in cost computations:

1. It is argued that interest is the cost of capital as wages are the reward for labour. Both are factors of production. Therefore if wages are included in cost of production, why not interest.
2. The exclusion of interest from Cost Accounts would distort cost in certain industries like wine-making timber-maturing, etc., where the waiting period is long. For example, a timber merchant may buy standing trees and then season the timber himself, waiting for a number of years before he can use or sell it. Another merchant may buy already seasoned timber which is ready for use or sale. The latter will pay a much higher price per unit. One of the reasons for this higher price may be on account of interest charges on the investment during the period when timber was seasoned. Therefore, for proper comparison of costs, the former timber merchant must add interest on funds invested for the period he had to wait.
3. Without inclusion of interest on capital, profits on different jobs or operations may not be comparable.
4. Many times exclusion of interest cost may lead the management to take wrong decisions, particularly in the case of replacement of human labour by machines. It would be wrong to accept any capital expenditure proposal without taking into account the interest on capital investment along with other costs of operations.
5. The significance of time-value of money is recognised only when interest is treated as an clement of cost. A person can invest his money in government or other safe securities and get regular income without much efforts. If he invests the same money in business, he should include interest in his costs to arrive at the true profits from the business which may be considered as his reward for his exertions.

Arguments against the inclusion of interest in Cost Accounts are:

1. Payment of interest by a firm depends purely on its financial policies. It is argued that interest is a purely financial matter and, therefore, cannot be treated as an element of cost.
2. It is not easy to calculate the interest cost on capital. Its calculation may lead to various complications because of different interpretations of the term capital, e.g., owner's capital, fixed capital, capital employed, etc.

3. Moreover, determination of a proper rate of interest will also pose a problem. In the market, there exists a variety of rates which are affected by a number of factors such as risk period of maturity, bank rate etc.
4. Where one manufactures a number of products, interest on capital is difficult to apportion to each product as no specific basis for apportionment is acceptable.

   In conclusion it may be said that atleast on the ground of practical difficulty, interest need not be recorded in cost accounts. But it should certainly be taken into account while making cost comparisons and preparing cost reports for management decisions (specially pricing decisions).

Question 35

Explain, how under absorption and over-absorption of overheads are treated in Cost Accounts. *(November, 1998, 4 marks)*

Answer

Production overheads are generally recovered or charged on the goods on some predetermined basis. Irrespective of the method used for the recovery of overheads, it has been observed that a difference arises between the amount of overheads absorbed and the amount of overheads actually incurred. If the absorbed amount is more than the overheads actually incurred then such a difference is termed as an over absorption of overheads. If the recovery is less than the actual overheads incurred then the difference is termed as under absorption of overheads. The over- absorbed and under-absorbed amount of overheads can be treated in Cost Accounts by following any one of the methods explained below:

Cost Accounts treatment of under-absorption and over- absorption of overheads:

The under-absorption and over-absorption of overheads can be disposed off in cost accounting by using any one of the following methods.

(i) Use of supplementary rates

(ii) Writing off to Costing Profit & Loss Account

(iii) Carrying over to the next year's account

(i) *Use of supplementary rates:* This method is used to adjust the difference between overheads absorbed arid overheads actually incurred by computing supplementary overhead rates. Such rates may be either positive or negative. A positive rate is intended to add the unabsorbed overheads to the cost of production. The negative rate, however corrects the cost of production by deducting the amount of over-absorbed overheads. The effect of applying such a rate is to make the actual overheads get completely absorbed.

(ii) *Writing off to Costing Profit & Loss Account:* When under or over-absorbed amount is quite negligible and it is not felt worthwhile to absorb it by using supplementary rates, then the said amount may be transferred to Costing Profit & Loss Account. In

case under-absorption of overheads arises due to factors like idle capacity, defective planning etc., it may also be transferred to Costing Profit & Loss Account.

(iii) *Carrying over to the next year's account:* Under this method the amount of under/over-absorbed overhead may be carried over to the next year's account. This method is not considered appropriate as it allows costs of one period to affect costs of another period. Further, comparison between one period and another is rendered difficult. Therefore, this method is not proper and has only a limited application. However, this method may be used when the normal business cycle extends over more than one year, or in the case of a new project where the output is low in the initial years.

Question 36

How do you deal with the following in Cost Account?

(i) Research and Development Expenses

(ii) Fringe benefits *(November, 1998, 4 marks)*

Answer

(i) Research and Development Expense: Research and Development expense is the expense incurred for searching new or improved products, production methods / techniques or plants / equipments. Research expense may be incurred for carrying basic or applied research. Both basic and applied research relates to original investigations to gain from new scientific or technical knowledge and understanding, which is not directed towards any specific practical aim (under basic research) and is directed towards a specific practical aim or objective (under applied research).

Treatment in Cost Accounts: Expense of Basic Research (if it is a continuous activity) be charged to the revenues of the concern. It may be spread over a number of years if research is not a continuous activity and amount is large.

Expense of applied research, if relates to all existing products and methods of production then it should be treated as a manufacturing overhead of the period during which it has been incurred and absorbed. Such expenses are directly charged to the product, if it is solely incurred for it.

If applied research is conducted for searching new product or methods of production etc., then the research expense treatment depends upon the outcome of such research. For example, if research findings are expected to produce future benefits or if it appears that such findings are going to result in failure then the costs incurred may be a mortised by charging to the Costing Profit and Loss Account of one or more years depending upon the size of expenditure. If research proves successful,, then such costs will be charged to the concerned product.

Development expenses begins with the implementation of the decision to produce a new or improved product or to employ a new or improved method. The treatment of development expenses is same as that of applied research.

(ii) Fringe benefits: In every organisation, workers are paid some benefits in addition to their normal wage or salary. These additional benefits are popularly called fringe benefits. They include:

(i) Housing

(ii) Children education allowance

(iii) Holiday pay

(iv) Leave pay

(v) Leave travel concession to home town or any place in India etc.

Expenses incurred on fringe benefits in respect of factory workers should be treated as factory overheads and apportioned among the production and service departments on the basis of number of workers in each department.

Fringe benefits to office and selling and distribution staff should be treated as administration overheads and selling and distribution overheads respectively and recovered accordingly.

Question 37

Soloproducts Ltd. Manufactures and sells a single product and has estimated a sales revenue of Rs 126 lakhs this year based on a 20% profit on selling price. Each unit of the product requires 3 lbs of material P and 1½ lbs of material Q for manufacture as well as a processing time of 7 hours in the Machine Shop and 2½ hours in the Assembly Section. Overheads are absorbed at a blanket rate of 33-1/3% on Direct Labour. The factory works 5 days of 8 hours a week in a normal 52 weeks a year. On an average statutory holidays, leave and absenteeism and idle time amount to 96 hours, 80 hours and 64 hours respectively, in a year.

The other details are as under

Purchase price	*Material P*	*Rs. 6 per lb*	
	Material Q	*Rs 4 per lb*	
Comprehensive			
Labour rate	*Machine shop*	*Rs 4 per hour*	
	Assembly	*Rs 3.20 per hour*	
No. of Employees	*Machine shop*	*600*	
	Assembly	*180*	
	Finished Goods	*Material P*	*Material Q*
Opening stock	*20,000 units*	*54,000 lbs*	*33,000 lbs*
Closing stock (Estimated)	*25,000 units*	*30,000 lbs*	*66,000 lbs*

You are required to calculate:

(a) The number of units of the product proposed to be sold.

(b) Purchased to be made of materials P and Q during the year in Rupees.

(c) Capacity utilization of machine shop and Assembly section, along with your comments.

Answer

Working Notes:

1. **Statement of selling price per unit of the product**

Material cost	*Rs*
P: 3 lbs x Rs.6 = Rs. 18	
Q: 1.5 lbs x Rs.4 = Rs. 6	24
Labour cost	
Machine shop 7 hrs x Rs. 4 = Rs. 28	
Assembly shop 2.5 hrs x Rs.3.20 = Rs. 8	36
Overheads	
33-1/3% of Direct Labour Cost	12
Cost (per unit)	72
Add: Profit 20% of selling price or 25% on cost	18
Selling price (per unit)	90

2. **The comprehensive labour rate has been assumed as direct labour.**

(a) The number of units of the product proposed to be sold

Selling price (per unit)	Rs.	90
Total sales revenue	Rs.	1,26,00,000
Number of units of the product proposed to be sold		1,40,000 Units

$$\frac{Rs.\,1,26,00,000}{Rs.\,90}$$

(b) Statement of material P and Q to be purchased during the year in Rupees

Materials	*Material Consumption (lbs)*	*Closing balance of material (lbs)*	*Opening balance of material (lbs)*	*Material to be purchased (lbs)*	*Purchase price Rs.*	*Amount Rs.*
(1)	*(2)*	*(3)*	*(4)*	*(2)+(3)-(4)=(5)*	*(6)*	*(5)x(6)=(7)*
P	*1,45,0000 x 3 = 4,35,000	30,000	54,000	4,11,000	6	24,66,000

Q	1,45,000x1.5 = 2,17,500	66,000	33,000	2,50,500	4	10,02,000
Total						34,68,000

Working Note:

Number of units of finished goods to be manufactured during the year

= Sales (units) during the year + Closing balance – Opening stock

= 1,40,000 units +25,000 units – 20,000 units

= 1,45,000 units

(c) Capacity Utilisation Statement of Machine shop and Assembly Section

	Machine shop	*Assembly Section*
Hours available during the year *(See working note)*	600 persons x 1,840 hrs. =11,04,000	180 Persons x 1,840 hrs. = 3,31,200
Hours required to manufacture 1,45,000 units	1,45,000 x 7 hrs. =10,15,000	1,45,000 x 2.5 hrs. =3,62,500
Surplus/(Deficit) hours	89,000	(31,300)
Capacity utilisation	91.94%	109.45%

Working note:

Hours available during the year: 5 days x 8 hrs x 52 weeks	2080 hrs.
Less: Statutory holidays, leave and absenteeism & idle time (96 hrs. +80 hrs. + 64 hrs.)	240 hrs.
	1,840 hrs.

Comments: From the statement of hours required to manufacture 1,45,000 units of the product, it is apparent that the total hours required in machine shop and assembly section would be 10,15,000 and 3,62,500 respectively. Whereas the available hours in machine shop and assembly section are 11,04,000 and 3,31,200 respectively. In this way there are 89,000 surplus hours in the machine shop and also a deficit of 31,300 hours in the assembly section. To resolve the problem of deficit in assembly section, following suggestions are made:

1. If the workers can be interchangeable then the assembly section utilize the services of workers which may be transferred from the machine shop to meet the production target of 1,45,000 units.
2. If the workers are not interchangeable then the assembly section may either resort to overtime or increase the strength of workers to catch up the budgeted production. Under both the ways i.e resorting to overtime or increasing the strength in assembly section, the profit of the concern will be reduced.

Question 38

In a factory following the job costing Method, an abstract from the work in process as at 30th September was prepared as under:

Job No.	*Material*	*Director Labour*		*Factory overheads Applied*
	Rs.		*Rs.*	*Rs.*
115	*1,325*	*400 hours*	*800*	*640*
118	*810*	*250 hours*	*500*	*400*
120	*765*	*300 hours*	*475*	*380*
	2,900		*1,775*	*1,420*

Material used in October were as follows :

Material requisition No.	*Job No.*	*Cost Rs.*
54	*118*	*300*
55	*118*	*425*
56	*118*	*515*
57	*120*	*665*
58	*121*	*910*
59	*124*	*720*
		3,535

A summary of Labour Hours deployed during October is as under:

Job no	*Number of Hours*	
	Shop A	*Shop B*
115	*25*	*25*
118	*90*	*30*
120	*75*	*10*
121	*65*	*—*
124	*20*	*10*
	275	*75*
Indirect Labour:		
Waiting for material	*20*	*10*
Machine Breakdown	*10*	*5*
Indle time	*5*	*6*
Overtime Premium	*6*	*5*
	316	*101*

A shop credit slip was issued in October, that material issued under Requisition No. 54 was returned back to stores as being not suitable. A material Transfer Note issued in October indicated that material issued under requisition No.55 for job 118 was directed to job 124.

The hourly rate in shop A per labour hour is Rs. 3 per hour while at shop B, it is Rs. 2 per hour. The Factory Overhead is applied at the same rate as in September. Jobs 115, 118 and 120 were completed in October.

You are asked to compute the factory cost of the completed jobs. It is the practice of the management to put a 10% on the factory cost to cover administration and selling overheads and invoice the job to the customer on a total cost plus 20% basis. What would be the invoice price of these three jobs?

Answer

Factory Cost Statement of Completed Jobs

Month	*Job No.*	*Materials*	*Direct labour*	*Factory Overheads (80% of direct labour cost)*	*Factory cost*
		Rs.	*Rs.*	*Rs.*	*Rs.*
September	115	1,325	800	640	2,765
October	115	—	125	100	225
Total		1,325	925	740	2,990
September	118	810	500	400	1,710
October	118	515	330	264	1,109
Total		1,325	830	664	2,819
September	120	765	475	380	1,620
October	120	665	245	196	1,106
Total		1,430	720	576	2,726

Invoice price of completed jobs

Job no.	*115*	*118*	*120*
	Rs.	*Rs.*	*Rs.*
Factory cost	2,990	2,819	2,726
Administration and Selling overheads @ 10% of factory cost	299	281..90	272.6
Total Cost	3,289	3,100.90	2,998.60
Profit	657.80	620.18	599.72
(20% of Total cost)			
Invoice price	3,946.80	3,721.08	3.598.32

Note: In the above solution it has been assumed that indirect labour costs have been included in the factory overhead and they have been recovered as 80% of the labour cost.

Question 39

Modern manufacturers Ltd. Have three production department P1, P2 and P3 and two Service Departments S1 and S2 the details pertaining to which are as under:-

	P1	*P2*	*P3*	*S1*	*S2*
Direct Wages (Rs.)	*3,000*	*2,000*	*3,000*	*1,500*	*195*
Working Hours	*3,070*	*4,475*	*2,419*	*–*	*–*
Value of Machines (Rs.)	*60,000*	*80,000*	*1,00,000*	*5,000*	*5,000*
HP of Machines	*60*	*30*	*50*	*10*	*–*
Light Points	*10*	*15*	*20*	*10*	*5*
Floor space (Sq.Ft.)	*2,000*	*2,500*	*3,000*	*2,000*	*500*

The following figures extracted from the Accounting records are relevant:

	Rs.
Rent and Rates	*5,.000*
General Lighting	*600*
Indirect Wages	*1,939*
Power	*1,500*
Depreciation on Machines	*10,000*
Sundries	*9,695*

The expenses of the service departments are allocated as under:-

	P1	*P2*	*P3*	*S1*	*S2*
S1	*20%*	*30%*	*40%*	*–*	*10%*
S2	*40%*	*20%*	*30%*	*10%*	*–*

Find out the total cost of product X which is processed for manufacture in Departments P1, P2 and P3 for 4,5 and 3 hours respectively, given that its Direct Material cost in Rs. 50 Direct Labour cost Rs.30.

Answer

Statement Showing Distribution of Overheads of Modern Manufacturers Ltd.

Particulars			*Production Depts.*			*Service Depts.*	
	Basis	*Total*	*P1*	*P2*	*P3*	*S1*	*S2*
		Rs.	*Rs.*	*Rs.*	*Rs.*	*Rs.*	*Rs.*
Rent and Rates	Area	5,000	1,000	1,250	1,500	1,000	250
General Lighting	Light points	600	100	150	200	100	50
Indirect Wages	Direct Wages	1,939	600	400	600	300	39
Power	H.P.	1,500	600	300	500	100	–

Depreciation of machines	Value of machines	10,000	2,400	3,200	4,000	200	200
Sundries	Direct Wages	9,695	3,000	2,000	3,000	1,500	195
		28,734	7,700	7,300	9,800	3,200	734

Redistribution of Service Departments' Expenses Over Production Departments

Particulars		*Production Depts.*			*Service Depts.*	
	Total	*P1*	*P2*	*P3*	*S1*	*S2*
	Rs.	*Rs.*	*Rs.*	*Rs.*	*Rs.*	*Rs.*
Total Overheads	28,734	7,700	7,300	9,800	3,200	734
Dept. S1 Overheads apportioned in the ratio (20:30:40:– : 10)	3,200	640	960	1,280	–3,200	320
Dept. S2 Overheads apportioned in the ratio (40:20:30:10:–)	1,054	421.60	210.80	316.02	105.40	–1.054
Dept. S1 Overheads apportioned in the ratio (20:30:40: - : 10)	105.40	21.08	31.62	42.16	–105.40	10.54
Dept. S2 Overheads apportioned in the ratio (40:20:30:10:–)	10.54	4.22	2.11	3.16	1.05	-10.54
Dept. S1 Overheads apportioned in the ratio (20:30:40:–10)	1.05	0.21	0.32	0.42	-1.05	0.10
Dept. S2 Overheads apportioned in the ratio (40:20:30:10:–)	0.10	0.05	0.02	0.03	—	-0.10
Total		8,787.16	8,504.87	11,441.79		
Working hours		3,070	4,475	2,419		
Overhead rate per hour		2.86	1.90	4.73		
(See working Note. 1)						
Cost of the product 'X'	*Rs.*					
Direct Material Cost	50					
Direct Labour Cost	30					
Overhead Cost	35.13					
(See Working Note 2)						
	115.13					

Working Note:

1. Overhead rate per hour for production department

$$P_1 = \frac{Rs.8,787.16}{3,070} = Rs.\ 2.86$$

Similarly overhead rate for production departments P2 and P3 are Rs. 1.90 and Rs. 4.73

2. Overhead cost

Rs. 2.86 x 4 + Rs.1.90 x 5 + Rs. 4.73 x 3

= Rs.11.44 + Rs. 9.50 + Rs. 14.19 = Rs.35.13

Note: *The service departments have only indirect costs which are to be absorbed by production departments. However if the direct wages appearing in the question are assumed to be incurred on the service department only, which have not been accounted for, by any other activity carried on in the service departments, then total expenses of the service departments including the aforesaid direct wages would also be charged to the respective production departments. If this assumption holds good the alternative solution can appear as under:*

ALTERNATIVE SOLUTION

Statement Showing Distribution of Overheads of Modern Manufacturers Ltd.

Particulars			*Production Depts.*			*Service Depts.*	
	Basis	*Total*	*P1*	*P2*	*P3*	*S1*	*S2*
		Rs.	*Rs.*	*Rs.*	*Rs.*	*Rs.*	*Rs.*
Direct Wages	Actual	1,695	—	—	—	1,500	195
Rent & Rates	Area	5,000	1,000	1,250	1,500	1,000	250
General Lighting	Light Points	600	100	150	200	100	50
Indirect Wages	Direct Wages	1,939	600	400	600	300	39
Power	H.P.	1,500	600	300	500	100	—
Depreciation of Machines	Value of Machines	10,000	2,400	3,200	4,000	200	200
Sundries	Direct Wages	9,695	3,000	2,000	3,000	1,500	195
		30,429	7,700	7,300	9,800	4,700	929

Redistribution of Service Departments Expenses over Production Departments.

	Total	*P1*	*P2*	*P3*	*S1*	*S2*
	Rs.	*Rs.*	*Rs.*	*Rs.*	*Rs.*	*Rs.*
Total Overheads	30,429	7,700	7,300	9,800	4,700	929
Dept. S1 Overheads apportioned in the ratio (20:30:40:– : 10)	4,700	940	1,410	1,880	-4,700	470

Dept. S2 Overheads apportioned in the ratio (40:20:30:10:–)	1,399	559.60	279.8	419.7	139.9	–1.399
Dept. S1 Overheads apportioned in the ratio (20:30:40: - : 10)	139.90	27.98	41.97	55.96	–139.9	13.99
Dept. S2 Overheads apportioned in the ratio (40:20:30:10:–)	13.99	5.60	2.80	4.20	1.40	-13.99
Dept. S1 Overheads apportioned in the ratio (20:30:40:–10)	1.40	0.28	0.42	0.56	-1.40	0.14
Dept. S2 Overheads apportioned in the ratio (40:20:30:10:–)	0.14	0.06	0.03	0.05	-	-0.14
Total		9,233.52	9,035.02	12.160.47		
Working hours		3,070	4,475	2,419		
Overhead rate per hour		3.00	2.02	5.03		
Cost of the Product 'X'				*Rs.*		
Direct Material Cost				50		
Direct Labour Cost				30		
Overhead Cost				37.25		
(See Working Note 1)						
Total Cost				117.25		

Working Note

1. Overhead cost:

   = Rs. 3 × 4+ Rs. 2.02 × 5 + Rs. 5.03 × 3

   = Rs. 12 + Rs. 10.10 + Rs. 15.15 = 37.25

Question 40

PH Ltd. is a manufacturing company having three production departments, 'A' 'B' and 'C' and two service departments 'X' and 'y'. The following is the budget for December 1981:

	Total	*A*	*B*	*C*	*X*	*Y*
	Rs	*Rs.*	*Rs.*	*Rs.*	*Rs.*	*Rs.*
Direct Material		*1,000*	*2,000*	*4,000*	*2,000*	*1,000*
Direct Wages		*5,000*	*2,000*	*8,000*	*1,000*	*2,000*
Factory rent	*4,000*					
Power	*2,500*					
Depreciation	*1,000*					

Other overheads	*9,000*					
Additional information						
Area(Sq.ft.)		*500*	*250*	*500*	*250*	*500*
Capital Value (Rs. Lacs) of assets		*20*	*40*	*20*	*10*	*10*
Machine hours		*1,000*	*2,000*	*4,000*	*1,000*	*1,000*
Horse power of machines		*50*	*40*	*20*	*15*	*25*

A technical assessment or the apportionment of expenses of service departments is as under:

	A	*B*	*C*	*X*	*Y*
	%	*%*	*%*	*%.*	*%*
Service Dept. 'X'	*45*	*15*	*30*	*-*	*10*
Service Dept. 'Y'	*60*	*35*	*-*	*5*	*-*

Required:

(i) A statement showing distribution of overheads to various departments.

(ii) A statement showing re-distribution of service departments expenses to production departments.

(iii) Machine hours rates of the production departments 'A', 'B' and 'C'.

Answer

(i) Overhead Distribution Summary

	Basis	*Total*	*A*	*B*	*C*	*X*	*Y*
		Rs.	*Rs.*	*Rs.*	*Rs.*	*Rs.*	*Rs.*
Direct materials	Direct	-	-	-	-	2,000	1,000
Direct wages	,,					1,000	2,000
Factory rent	Area	4,000	1,000	500	1,000	500	1,000
Power	H.P X M/c Hrs.	2,500	500	800	800	150	250
Depreciation	Cap. Value	1,000	200	400	200	100	100
Other Overheads	M/c hrs.	9,000	1,000	2,000	4,000	1,000	1,000
		–	2,700	3,700	6,000	4,750	5,350

(ii) Redistribution of Service Department's expenses:

	A	*B*	*C*	*X*	*Y*
	Rs.	*Rs.*	*Rs.*	*Rs.*	*Rs.*
Total Overheads	2,700	3,700	6,000	4,750	5,350

Dept . X overhead apportioned in the ratio (45 : 15 : 30 : 10)	2,138	712	1,425	- 4,750	475
Dept . Y overhead apportioned in the ratio (60: 35 : -- : 5)	3,495	2,039	--	291	- 5,825
Dept . X overhead apportioned in the ratio (45 : 15 : 30 : 10)	131	44	87	-- 291	29
Dept . Y overhead apportioned in the ratio (60: 35 : -- : 5)	17	10	--	2	- 29
Dept . X overhead apportioned in the ratio (45 : 15 : 30 : 10)	1	--	1	-- 2	--
	8,482	6,505	7,513	–	–

(iii) Machine Hour rate

Machine hours	1,000	2,000	4,000
Machine hour rate (Rs.)	8.48	3.25	1.88

Question 41

Explain how under and over absorption of overheads are treated in cost accounts.

Answer

Treatment of under and over absorption of overheads in Cost Accounts: Under and over absorbed overheads can be disposed off in Cost Accounts by using any one of the following methods:

(ii) Use of supplementary rates.

(iii) Writing off to Costing Profit and Loss Account.

(iv) Carrying over to the next year's account.

(i) Use of Supplementary Rates: This method is used to adjust the difference between overheads absorbed and overheads actually incurred by computing supplementary overhead rates. Such rates may be either positive or negative. A positive rate is intended to add the unabsorbed overheads to the cost of production. The negative rate, however, corrects the cost of production by deducting the amount of over-absorbed overheads. The effect of applying such rate is to make the actual overhead get completely absorbed.

(ii) Writing off to Costing Profit & Loss Account: When under or over absorbed amount of overheads is quite negligible and it is not felt worth while to absorb it by using supplementary rates, the said amount is transferred to Costing Profit & Loss Account. In case under absorption of overheads arises due to factors like idle capacity, defective planning etc. Then also it may be transferred to Costing Profit & Loss Account.

(iii) Carrying over to the next year's accounts*:* Under this method,the amount of over/under absorbed overhead is carried over to the next period this method is not considered desirable as it allows costs of one period to affect cost of another/period.

Further, comparison between one period and another is rendered difficult. However, this method may be used when the normal business cycle extends over more than one year, or in the case of a new project, the output is low in the initial years.

Question 42

A machine shop has 8 identical Drilling Machines manned by 6 operators. The machines cannot be worked without an operator wholly engaged on it. The original cost of all these 8 machines works out to Rs. 8 lakhs. These particulars are furnished for a 6 month period:-

Normal available hours per month	*208*
Absenteeism (without pay)- hours	*18*
Leave (with pay)-hours	*20*
Normal idle time unavoidable-hours	*10*
Average rate of wages per day of 8 hours	*Rs.20*
Production Bonus estimated	*15% on wages*
Value of Power consumed	*Rs.8,050*
Supervision and Indirect Labour	*Rs. 3,300*
Lighting and Electricity	*Rs. 1,200*

These particulars are for a year:

Repairs and maintenance including consumables 3% on the value of machines.

Insurance Rs. 40,000.

Depreciation 10% on original cost.

Other Sundry works expenses Rs. 12,000

General Management expenses allocated Rs. 54,530

You are required to work out a comprehensive machine hour rate for the Machine Shop.

Answer

Computation of Comprehensive Machine Hour Rate of Machine Shop

	Rs.
Operator's Wages *(See Note 2)*	17,100
Production Bonus *(15% on wages)*	2,565
Power Consumed	8,050
Supervision	3,300
Lighting and Electricity	1,200
Repairs and Maintenance	12,000
Insurance	20,000

Depreciation	40,000
Sundry Works Expenses	6,000
General Management Expenses	27,265
	1,37,480

$$\text{Machine Hour Rate} = \frac{\text{Total Overheads of Machine Shop}}{\text{Hours of Machines Operation}}$$

$$= \frac{\text{Rs. 1,37,480}}{\text{5,760 hours}} \textit{ (See Note 1)}$$

$$= \text{Rs. 23.87}$$

Notes :

Computation of Hours, for which 6 operators are available for 6 months.

Normal available hours p.m. per operator		208
Less: Absenteeism hours	18	
Leave Hours	20	
Idle Time Hours	10	48
Utilisable Hours p.m. per operator		160

Total utilisable hours for 6

Operators and for 6 months are = 160 X 6 X 6 = 5,760 hours.

As machines cannot be worked without an operator wholly engaged on them therefore, hours for which 6 operator are available for 6 months are the hours for which machines can be used. Hence 5,760 hours represent total machine hours.

2. Average rate of wages: $\frac{\text{Rs. 20}}{\text{8 hours}}$ = Rs. 2.50 per hour.

Hours per month for which wages are paid to a worker = 190
(208 hours – 18 hours)

Total wages paid to 6 operators for 6 months
= 190 hours × 6 × 6 × Rs. 2.50 = Rs. 17,100

Question 43

Gemini Enterprises undertakes three different jobs A,B and C.All of them require, the use of a special machine and also the use of a computer. The computer is hired and the hire charges work out to Rs. 4,20,000/- per annum. The expenses regarding the machine are estimated as follows.

	Rs.
Rent for the quarter	*17,500*
Depreciation per annum	*2,00,000*
Indirect charges per annum	*1,50,000*

During the first month of operation the following details were taken from the job register :

Job	*A*	*B*	*C*
Number of hours the machine was used :			
(a) Without the use of computer	*600*	*900*	*–*
(b) With the use of the computer	*400*	*600*	*1,000*

You are required to compute the machine hour rate:-

(a) For the firm as a whole for the month when the computer was used and when the computer was not used.

(c) For the individual jobs A, B and C.

Answer

Working Notes :

(i)	Total machine hours used (600 + 900 + 400 + 600 + 1,000)	3,500
(ii)	Total machine hours without the use of computers (600 + 900)	1,500
(iii)	Total machine hours with the use of computer (400 + 600 + 1,000)	2,000
(iv)	Total overhead of the machine per month	*Rs.*
	Rent (Rs. 17,500 /3)	5,833.33
	Depreciation (Rs. 2,00,000 / 12)	16,666.67
	Indirect charges (Rs. !,50,000/12)	12,500.00
Total		35,000.00

(v) Computer hire charges for a month = Rs. 35,000
(Rs. 4,20,000 / 12)

(vi) Overheads for using machines without computer = Rs. 15,000

$$\left(\frac{\text{Rs. } 35{,}000}{3{,}500 \text{ hrs.}}\right) \times 1{,}500 \text{ hrs.}$$

(vii) Overheads for using machine with computer = Rs. 55,000

$$\left(\frac{\text{Rs. } 35{,}000}{3{,}500 \text{ hrs.}} \times 2{,}000 \text{ hrs.} + \text{Rs. } 35{,}000\right)$$

(a) Machine Hour Rate of Gemini Enterprises for the firm as a whole, for a month.

(1) When the computer was used : $\frac{\text{Rs. } 55{,}000}{2{,}000 \text{ hours}}$ = Rs27.50 per hour.

(2) When the computer was not used : $\frac{\text{Rs. } 35{,}000}{3{,}500 \text{ hours}}$ = Rs.10 per hour.

(b) Machine hour rate for the individual jobs.

Job	*Rate per hr.*	*A*		*B*		*C*	
	Rs.	*Hrs*	*Rs.*	*Hrs*	*Rs.*	*Hrs*	*Rs.*
Overheads							
Without computer	10	600	6,000	900	9,000	-	-
With computer	2750	400	11,000	600	16,500	1,000	27,500
		1,000	17,000	1,500	25,500	1,000	27,500
Machine hour rate			Rs. 17		Rs. 17		Rs. 27.50

Question 44

Deccan Manufacturing Ltd. have three departments which are regarded as production departments. Service departments' costs are distributed to these production departments using the "Step Ladder Method" of distribution . Estimates of factory overhead costs to be incurred by each department in the forthcoming year are as follows. Data required for distribution is also shown against each department:

Department	*Factory overhead*	*Direct Labour*	*No.of Employees*	*Area in sq. m.*
	Rs.	*Hours*		
Productions				
X	*1,93,000*	*4,000*	*100*	*3,000*
Y	*64,000*	*3,000*	*125*	*1,500*
Z	*83,000*	*4,000*	*85*	*1,500*
Services				
P	*45,000*	*1,000*	*10*	*500*
Q	*75,000*	*5,000*	*50*	*1,500*
R	*1,05,000*	*6,000*	*40*	*1,000*
S	*30,000*	*3,000*	*50*	*1,000*

The overhead costs of the four service departments are distributed in the same order, viz., P,Q,R and S respectively on the following basis:

Department		*Basis*
P	_	*Number of Employees*
Q	_	*Direct Labour Hours*
R	_	*Area in square meters*
S	_	*Direct Labour Hours*

You are required to:

(a) prepare a schedule showing the distribution of overhead costs of the four service departments to the three production departments; and

(b) calculate the overhead recovery rate per direct labour hour for each of the three production departments.

Answer : (a)

DECCAN MANUFACTURING LIMITED

Schedule Showing the Distribution of Overhead Costs among Departments

	Service				*Production*		
	P	*Q*	*R*	*S*	*X*	*Y*	*Z*
	Rs.	*Rs.*	*Rs.*	*Rs.*	*Rs.*	*Rs.*	*Rs.*
Overhead cost	45,000	75,000	1,05,000	30,000	1,93,000	64,000	83,000
Distribution of Overhead							
Costs of Dept.`P`	(45,000)	5,000	4,000	5,000	10,000	12,500	8,500
Distribution of Overhead							
Costs of Dept.`Q`	_	(80,000)	24,000	12,000	16,000	12,000	16,000
Distribution of Overhead							
Costs of Dept.`R`	_	_	(1,33,000)	19,000	57,000	28,500	28,500
Distribution of Overhead							
Costs of Dept.`S`	_	_	_	(66,000)	24,000	18,000	24,000
Total					3,00,000	1,35,000	1,60,000 ....(A)
(b) Direct Labour hours					4,000	3,000	4,000 .....(B)
Overhead recovery rate per hour: [(A)/(B)]					Rs. 75/-	Rs.45/-	Rs.40/-

Question 45

A Ltd. manufactures two products A and B.The manufacturing division consists of two production departments P1and P2 and two services S1 and S2.

Budgeted overhead rates are used in the production departments to absorb factory overheads to the products. The rate of Department P1 is based on direct machine hours, while the rate of Department P2 is based on direct labour hours. In applying overheads,the pre-determined rates are multiplied by actual hours.

For allocating the service department costs to production departments, the basis adopted is as follow:

(i) Cost of Department S1 to Department P1 and P2 equally, and

(ii) Cost of Department S2 to Department P1 and P2 in the ratio 2:1 respectively.

The following budgeted and actual data are available:

Annual profit plan data:

Factory overhead budgeted for the year:

		Rs.		Rs.
Departments	*P1*	*25,50,000*	*S1*	*6,00,000*
	P2	*21,75,000*	*S2*	*4,50,000*

Budgeted output in units:

Product A– 50,000; B – 30,000.

Budgeted raw material cost per unit:

Product A – Rs. 120 ; Product B –Rs. 150.

Budgeted time required for production per unit:

Department P1: Product A: 1.5 machine hours

Product B: 1.0 machine hour

Department P2: Product A: 2 Direct labour hours

Product B: 2.5 Direct labour hours

Average wage rates budgeted in Department P2 are: Product A –Rs72 per hour

and Product B – Rs. 75 per hour.

All materials are used in Department P1 only.

Actual data (for the month of July,1993)

Units actually produced: Product A: 4,000 units

Product B: 3,000 units

– *Actual direct machine hours worked in Department P1*

On product A – 6,100 hours, Product B-4,150 hours.

– *Actual direct labour hours worked in Department P2*

On product A – 8,200 hours, Product B-7,400 hours.

Cost actually incurred:

	Product A	Product B
Raw materials:	*Rs. 4,89,000*	*Rs. 4,56,000*
Wages:	*Rs. 5,91,900*	*Rs. 5,52,000*

		Rs.		*Rs.*
Overheads: Department	*P1*	*Rs. 231,000*	*S1*	*Rs. 60,000*
	P2	*Rs. 2,04,000*	*S2*	*Rs. 48,000*

You are required to:

(i) Compute the predetermined overhead rate for each production department.

(ii) Prepare a performance report for July. 1993 that will reflect the budgeted costs and actual costs.

Answer

(i) Computation of predetermined overhead rate for each production department from budgeted data

	Production Deptts.		*Service Deptts.*	
	P1	*P2*	*S1*	*S2*
Budgeted factory overheads for the year in (Rs.)	25,50,000	21,75,000	6,00,000	4,50,000
Allocation of service department S1's costs to production departments P1 and P2 equally in (Rs.)	3,00,000	3,00,000	- 6,00,000	_
Allocation of service department S2's costs to production department P1 and P2 in ratio of 2:1 in (Rs.)	3,00,000	1,50,000	_	- 4,50,000
Total (Rs.)	31,50,000	26,25,000	Nil	Nil
Budgeted machine hours in department P1 *(Refer to working Note1)*	1,05,000			
Budgeted machine hours in department P2 *(Refer to working Note 1)*	–	1,75,000		
Budgeted machine hour rate *(Rs. 31,50,000/1,05,000)*	Rs. 30			
Budgeted machine hour rate *(Rs. 26,25,000/1,75,000)*		Rs. 15		

(ii) Performance report for July, 1993 (When 4,000 and 3,000 units of products and B respectively were actually produced)

	Budgeted	*Actual*
	Rs.	*Rs.*
Raw material used in department P1		
A : 4,000 units ×Rs. 120	4,80,000	4,89,000
A : 3,000 units ×Rs. 150	4,50,000	4,56,000

Direct Labour		
Cost on the basis of labour hours worked in department P2		
4,000 × 2 hrs. × Rs.72	5,76,000	5,91,900
3,000 × 2.5 hrs. ×Rs.75	5,62,500	5,52,000
Overhead absorbed		
On machine hour basis in department P1		
A: 4,000 × 1.5 hrs. × Rs.30	1,80,000	1,74,400*
B. 3,000 × 1 hr.× Rs.30	90,000	1,18,649
Overhead absorbed		
On machine hour basis in department P2		
A: 4,000 × 2 hrs. × Rs.15	1,20,000	1,31,364**
B: 3,000 × 2.5 hrs.× Rs.15	1,12,500	1,18,548
	25,71,000	26,31,861

* (Refer to working Note 4)

**(Refer to Working Note 5)

Working Notes:

	Product A	*Product B*	*Total*
1. Budgeted output (in units)	50,000	30,000	
Budgeted machine hours In department P1	75,000 (50,000 ×1.5 hrs.)	30,000 (30,000 ×1 hrs.)	1,05,000
Budgeted labour hours In department P2	1,00,000 (50,000 × 2 hrs.)	75,000 (30,000 × 2.5 hrs.)	1,75,000

	Product A	*Product B*	*Total*
2. Actual output (in units)	4,000	3,000	
Actual machine hours utilised in department P1	6,100	4,150	10,250
Actual labour hours utilised in department P2	8,200	7,400	15,600

3. Computation of actual overhead rate for each production department from actual data

	Production Deptts.		*Service Deptts.*	
	P1	*P2*	*S1*	*S2*
Actual factory overheads for the month of July, 1993 in (Rs.)	2,31,000	2,04,000	60,000	48,000
Allocation of service department S1's costs in (Rs.) over production departments P1 and P2 equally.	30,000	30,000	–60,000	–
Allocation of service department S2's costs in (Rs.) over production departments P1 and P2 in the ratio of 2:1	32,000	16,000	–	–48,000
Total (Rs.)	2,93,000	2,50,000	Nil	Nil
Actual machine hours in department P1 *(Refer to Working Note 2)*	10,250	—	—	—
Actual labour hours in department P2 *(Refer to Working Note 2)*	—	15,600	—	—
Machine hour rate *(Rs. 2,93,000/10,250)*	Rs. 28.59			
Labour hour/ rate *(Rs. 2,50,000/15,600)*		Rs. 16.02		

4. Actual overheads absorbed (based on machine hours):

A: 6,100 hrs.× Rs. 28.59 = Rs. 1,74,400 (say)

B: 4,150 hrs.× Rs. 28.59 = Rs. 1,18,649 (say)

5. Actual overheads absorbed (based on labour hours):

A: 8,200 hrs.× Rs. 16.02 = Rs. 1,31,364

B: 7,400 hrs.× Rs. 16.02 = Rs. 1,18,548

Question 46

In a manufacturing unit, factory overhead was recovered at a pre- determined rate of Rs. 25 per man – day. The total factory overhead expenses incurred and the man-days actually worked were Rs. 41.50 lakhs and 1.5 lakhs man-days respectively. Out of the 40,000 units produced during a period, 30,000 were sold .

On analysing the reasons, it was found that 60% of the unabsorbed overheads were due to defective planning and the rest were attributable to increase in overhead costs.

How would unabsorbed overheads be treated in Cost Accounts?

Answer

Computation of Unabsorbed Overheads

Man – days worked	1,50,000
	Rs.
Overhead actually incurred	41,50,000
Less: Overhead absorbed @ Rs. 25%/- per man - day	
(Rs. 25 × 1,50,000)	37,50,000
Unabsorbed Overheads	4,00,000
Unabsorbed Overheads due to defective planning	2,40,000
(i.e 60% of Rs 4,00,000)	
Balance of Unabsorbed Overheads	1,60,000

Treatment of Unabsorbed Overheads in Cost Accounts

(i) The unabsorbed overheads of Rs. 2,40,000 due to defective planning to be treated as abnormal and therefore be charged to Costing Profit and Loss Accounts.

(ii) The balance unabsorbed overheads of Rs. 1,60,000 be charged to production i.e. 40,000 units at the supplementary overhead absorption rate i.e. Rs. 4/- per unit .

(Refer to Working Note)

	Rs.
Charge to Costing Profit and Loss Account as part of the cost of units sold	1,20,000
(30,000 units @ Rs. 4/-p.u.)	
Add: To Closing stock of finished goods	40,000
(10,000 units @ Rs. 4/- p.u.)	
Total	1,60,000

Working Note:

$$\text{Supplementary Overhead Absorption Rate} = \frac{\text{Rs. 1,60,000}}{\text{Rs. 40,000}}$$

$$= \text{Rs. 4/- p.u.}$$

Question 47

A machine shop has 8 identical drilling machines manned by 6 operators. The machine cannot be worked without an operator wholly engaged on it. The original cost of all these machines works out to Rs. 8 lakh. These particulars are furnished for a 6 month period.

Normal available hours per month per worker	*208*
Absenteeism (without pay) hours P.M. per worker	*18*
Leave (with pay) hours per worker P.M.	*20*
Normal idle time Unavoidable hours per worker P.M.	*10*
Average rate of wages per worker for 8 hours a day	*Rs.20*
Average rate of production bonus estimated	*15% on wages*
Value of Power consumed	*Rs. 8,050*
Supervision and indirect Labour	*Rs. 3,300*
Lighting and electricity	*Rs. 1,200*

These particulars are for a year:

Repairs and maintenance including consumables	*3% of value of machines*
Insurance	*Rs. 40,000*
Depreciation.	*10% of original cost*
Other sundry works expenses	*Rs. 12,000*
General management expenses allocated	*Rs. 54,530*

You are required to work out a comprehensive machine hour rate for the machine shop

(May 2000, 8 marks)

Answer

Computation of comprehensive machine hour rate of machine shop

	Rs.
Operator's wages	17,100
(Refer to working note 2)	
Production bonus (15% on wages)	2,565
Power consumed	8,050
Supervision and indirect labour	3,300
Lighting and electricity	1,200
Repairs and maintenance	12,000
Insurance	20,000
Depreciation	40,000
Other sundry works expenses	6,000
General management expenses allocated	27,265
Total overhead of machine shop	1,37,480

$$\text{Machine hour rate} = \frac{\text{Total overhead of machine shop}}{\text{Hours of machines operation}}$$

$$= \frac{\text{Rs.1,37,480}}{\text{5,760 hours}} \textit{ (Refer to working note 1)}$$

= Rs. 23.87

Working notes:

1. Computation of hours, for which 6 operators are available for 6 months.

Normal available hours p.m. per operator		208
Less: Absenteeism hours	18	
Less: Leave hours	20	
Less: idle time hours	10	48
Utilizable hours p.m. per operators		160

Total utilizable hour for 6 operators and

for 6 months are =160 hours × 6 operators × 6 months = 5,760 hours.

As machines cannot be worked without an operator wholly engaged on them, therefore hours for which 6 operators are available for 6 months are the hours for which machines can be used. Hence 5,760 hours represents total machine hours.

2 Computation of operator's wages

Total rate of wages per hour = Rs. 2.50

(Rs. 20/8 hours)

Hours per month for which wages are paid to a worker = 190 hours

(208 hours – 18 hours)

Total wages paid to 6 operators for 6 months = Rs. 17,100

(190 hours × 6 operators × 6 months × Rs.2.50)

Question 48

A company has two production departments and two service departments. The data relating to a period are as under:

		Production Department		Service Department	
		PD1	PD2	SD1	SD2
Direct materials	(Rs.)	80,000	40,000	10,000	20,000
Direct wages	(Rs.)	95,000	50,000	20,000	10,000
Overheads	(Rs.)	80,000	50,000	30,000	20,000
Power requirement at normal capacity operations	(Kwh)	20,000	35,000	12,500	17,500
During Power Consumption during the period	(Kwh)	13,000	23,000	10,250	10,000

The power requirement of these departments are met by a power generation plant. The said plant incurred an expenditure, which is not included above of Rs. 1,21,875 out of which a sum of Rs. 84,375 was variable and the rest fixed.

After apportionment of power generation plant costs to the four departments, the service department overheads are to be redistributed on the following bases:

		PD1	PD2	SD1	SD2
SD1	(Rs.)	50%	40%	---	10%
SD2	(Rs.)	60%	20%	20%	---

You are required to:

(i) Apportion the power generation plant costs to the four departments.

(ii) Re-apportion service department cost to production departments.

(iii) Calculate the overhead rates per direct labour hour of production departments, given that the direct wage rates of PD1 and PD2 are Rs. 5 and Rs. 4 per hour respectively.

Answer

(i) Statement of apportionment of Power generation plant costs to the four departments

	Total Costs Rs.	Basis of apportionment of power generation cost	Production departments		Service departments	
			PD1 Rs.	PD2 Rs.	SD1 Rs.	SD1 Rs.
Fixed expenditure	37,500	Normal capacity (kwh) { 4:7 :2:3 :3.5 }	8,824	15,441	5,515	7,720

Variable expenditure	84,375	Actual power consumption (kwh) { 13:23 : 10.25 : 10 }	19,500	34,500	15,375	15,000
Total	1,21,875		28,324	49,941	20,890	22,720
Overheads summary:						
Direct materials	30,000		--	--	10,000	20,000
Direct wages	30,000		--	--	20,000	10,000
Overheads	1,80,000		80,000	50,000	30,000	20,000
Total	3,61,875		1,08,324	99,941	80,890	72,720

(ii) Statement of Reapportionment of service department cost to production department by using repeated distribution method

	Total	*Production departments*		*Service departments*	
		PD1	*PD2*	*SD1*	*SD2*
	Rs.	*Rs.*	*Rs.*	*Rs.*	*Rs.*
Total overheads	3,61,875	1,08,324	99,941	80,890	72,720
Dept. SD1 overheads apportioned In the ratio [50: 40 : - : 10]	80,890	40,445	32,356	-80,890	8,089
Dept. SD2 overheads apportioned In the ratio [60: 20 : 20 : -]	80,809	48,485	16,162	16,162	-80,809
Dept. SD1 overheads apportioned In the ratio [50: 40 : - : 10]	16,162	8,081	6,465	-16162	1,616
Dept. SD2 overheads apportioned In the ratio [60: 20 : 20 : -]	1,616	970	323	323	-1,616
Dept. SD1 overheads apportioned In the ratio [50: 40 : - : 10]	323	162	129	-323	32
Dept. SD2 overheads apportioned In the ratio [60: 20 : 20 : -]	32	19.20	6.40	6.40	-32
Dept. SD1 overheads apportioned In the ratio [50: 40 : - : 10]	6.40	3.20	2.56	-6.40	0.64
Dept. SD2 overheads apportioned In the ratio [60: 20 : 20 : -]	0.64	0.38	0.13	0.13	- 0.64
Total		2,06,489.78	1,55,385.09	0.13	0.0

(iii) Computation of Overhead rates per direct labour hour of production departments

	Production departments	
	PD1	PD2
Total direct wages (Rs.) : (A)	95,000	50,000
Direct wage rate per hour (Rs.) : (B)	5/-	4/-
Direct labour hours (A/B) = (C)	19,000	12,500
Overheads (Rs.) : (D)	2,06,489.78	1,55,385.09
Overhead rate per	10.87	12.43
Direct labour hour (Rs.) : (D)/(C)		

Question 49

X Ltd. having fifteen different types of automatic machines furnishes information as under for 1996-97

(i) Overhead expenses: Factory rent Rs. 96,000 (Floor area 80,000 sq.ft.), Heat and gas Rs. 45,000 and supervision Rs. 1,20,000.

(ii) Wages of the operator are Rs. 48 per day of 8 hours . He attends to one machine when it is under set up and two machines while they are under operation.

In respect of machine B (one of the above machines) the following particulars are furnished:

(i) Cost of machine Rs 45,000, Life of machine- 10 years and scrap value at the end of its life Rs. 5,000

(ii) Annual expenses on special equipment attached to the machine are estimated as Rs. 3,000

(iii) Estimated operation time of the machine is 3,600 hours while set up time is 400 hours per annum

(iv) The machine occupies 5,000 sq.ft. of floor area.

(v) Power costs Rs. 2 per hour while machine is in operation.

Find out the comprehensive machine hour rate of machine B . Also find out machine costs to be absorbed in respect of use of machine B on the following two work- orders

	Work – order 31	*Work order – 32*
Machine set up time (Hours)	*10*	*20*
Machine operation time (Hours)	*90*	*180*

Answer

X Ltd.
Statement showing comprehensive machine Hour rate of Machine B

Standing Charges:	*Rs.*
Factory rent	6,000
(Rs. 96,000/80,000 sq.ft) × 5,000 Sq.ft.	
Heat and Gas	3,000
(Rs. 45,000/15 machines)	
Supervision	8,000
(Rs. 1,20,000/ 15 machines)	
Depreciation	4,000
[(Rs. 45,000 – Rs. 5,000)/ 10 years]	
Annual expenses on special equipment	3,000
	24,000
Fixed cost per hour	6/-
(Rs. 24,000/ 4,000 hrs.)	

	Set up rate Per hour	*Operational rate Per hour*
	Rs.	Rs.
Fixed cost	6	6
Power	--	2
Wages	6	3
Comprehensive machine hour rate per hr.	12	11

Statement of 'B' machine costs to be absorbed on the two work orders

	Work order 31			*Work order 31*		
	Hours	*Rate*	*Amount*	*Hours*	*Rate*	*Amount*
		Rs.	Rs.		Rs.	Rs.
Set up time cost	10	12	120	20	12	240
Operation time cost	90	11	990	180	11	1,980
Total cost			1,110			2,220

Question 50

E-books is an online book retailer. The Company has four departments. The two sales departments are Corporate Sales and Consumer Sales. The two support – departments are Administrative (Human Resources Accounting) and Information Systems each of the sales departments conducts merchandising and marketing operations independently.

The following data are available for October, 2003:

Departments	*Revenues*	*Number of Employees*	*Processing Time used (in minutes)*
Corporate Sales	*Rs. 16,67,750*	*42*	*2,400*
Consumer Sales	*Rs. 8,33,875*	*28*	*2,000*
Administrative	*--*	*14*	*400*
Information system	*--*	*21*	*1,400*

Cost incurred in each of four departments for October, 2003 are as follow:

Corporate Sales	*Rs. 12,97,751*
Consumer Sales	*Rs. 6,36,818*
Administrative	*Rs. 94,510*
Information systems	*Rs. 3,04,720*

The company uses number of employees as a basis to allocate Administrative costs and processing time as a basis to allocate Information systems costs.

Required:

(i) Allocate the support department costs to the sales departments using the direct method.

(ii) Rank the support departments based on percentage of their services rendered to other support departments. Use this ranking to allocate support costs based on the step-down allocation method.

(iii) How could you have ranked the support departments differently?

(iv) Allocate the support department costs to two sales departments using the reciprocal allocation method. (Nov. 2003, 2+2+1+5=10 marks)

Answer

(i)

Statement showing the allocation of support department costs to the sales departments (using the direct method)

Particulars	*Basis of allocation*	*Sales department*		*Support department*	
		Corporate sales	*Consumer sales*	*Administrative*	*Information systems*
		Rs.	*Rs.*	*Rs.*	*Rs.*
Cost incurred		12,97,751	6,36,818	94,510	3,04,720
Re-allocation of cost of administrative department	Number of employees (6:4:–:–)	56,706	37,804	(94,510)	
Re-allocation of costs of information systems department	Processing time (6:5:–:–)	1,66,211	1,38,509		(3,04,720)
Total		15,20,668	8,13,131		

(ii)

Ranking of support departments based on percentage of their services rendered to other support departments

- Administration support department provides 23.077% $\left(\frac{21\times100}{42+28+21}\right)$ of its services to information systems support department. Thus 23.077% of Rs. 94,510 = Rs.21,810.
- Information system support department provides 8.33% $\left(\frac{400}{2{,}400+2{,}000+400}\times100\right)$ of its services to Administration support department. Thus 8.33% of Rs. 3,04,720 = Rs. 25,383.

Statement showing allocation of support costs (By using step-down allocation method)

Particulars	*Basis of allocation*	*Sales department*		*Support department*	
		Corporate sales	*Consumer sales*	*Administrative*	*Information systems.*
		Rs.	*Rs.*	*Rs.*	*Rs.*
Cost incurred		12,97,751	6,36,818	94,510	3,04,720

Re-allocation of cost of administrative department	Number of employees (6:4:–:–3)	43,520	29,080	(94,510)	21,810 3,26,530
Re-allocation of costs of information systems department	Processing time (6:5:–:–:–)	1,78,107	1,48,423		(3,26,530)
Total		15,19,478	8,14,321		

(iii) An alternative ranking is based on the rupee amount of services rendered to other service departments, using the rupee figures obtained under requirement (ii) This approach would use the following sequence of ranking.

- Allocation of information systems overheads as first (Rs.25,383 provided to administrative).
- Allocated administrative overheads as second (Rs. 21,810 provided to information systems).

(iv) Working notes:

(1) **Percentage of services provided by each service department to other service department and sales departments.**

Particulars	*Service departments*		*Sale departments*	
	Administrative	*Information system*	*Corporate Sales*	*Consumer Sales*
Administrative	–	23.07%	46.16%	30.77%
Information systems	8.33%	–	50%	41.67%

(2) **Total cost of the support department:** *(By using simultaneous equation method).*

Let AD and IS be the total costs of support departments Administrative and Information systems respectively. These costs can be determined by using the following simultaneous equations:

	AD	=	94,510 + 0.0833 IS
	IS	=	3,04,720 + 0.2307 AD
or	AD	=	94,510 + 0.0833 {3,04,720 + 0.2307 AD}
or	AD	=	94,510 + 25,383 + 0.01922 AD
or	0.98078AD	=	1,19,893
or	AD	=	Rs. 1,22,243
and	IS	=	Rs. 3,32,922

Statement showing the allocation of support department costs to the sales departments (Using reciprocal allocation method)

Particulars	*Sales department*	
	Corporate sales Rs.	*Consumer sales Rs.*
Costs incurred	12,97,571	6,36,818
Re-allocation of cost administrative department *(46.16% and 30.77% of Rs. 1,22,243)*	56,427	37,614
Re-allocation of costs of information systems department *(50% and 41.67% of Rs. 3,32,922)*	1,66,461	1,38,729
Total	15,20,639	8,13,161

Question 51

Explain what do you mean by Chargeable Expenses and state its treatment in Cost Accounts. *(November, 2002, 3 marks)*

Answer

Chargeable expenses: All expenses, other than direct materials and direct labour cost which are specifically and solely incurred on production, process or job are treated as chargeable or direct expenses. These expenses in cost accounting are treated as part of prime cost,

Examples of chargeable expenses include - Rental of a machine or plant hired for specific job, royalty, cost of making a specific pattern, design, drawing or making tools for a job.

Question 52

A company manufacturing two products furnishes the following data for a year.

Product	*Annual output (Units)*	*Total Machine hours*	*Total number of purchase orders*	*Total number of set-ups*
A	*5,000*	*20,000*	*160*	*20*
B	*60,000*	*1,20,000*	*384*	*44*

The annual overheads are as under:

	Rs.
Volume related activity costs	*5,50,000*
Set up related costs	*8,20,000*
Purchase related costs	*6,18,000*

You are required to calculate the cost per unit of each Product A and B based on :

(i) Traditional method of charging overheads

(ii) Activity based costing method. *(November, 2002, 9 marks)*

Answer

Working notes:

1. *Machine hour rate* = $\frac{\text{Total annual overheads}}{\text{Total machine hours}}$

= $\frac{\text{Rs.19,88,000}}{\text{1,40,000 hours}}$ = Rs. 14.20 per hour

2. *Machine hour rate* = $\frac{\text{Total annual overhead cost for volume related activities}}{\text{Total machine hours}}$

= $\frac{\text{Rs.5,50,000}}{\text{1,40,000 hours}}$ = Rs. 3.93 (approx.)

3. *Cost of one set-up* = $\frac{\text{Total costs related to set-ups}}{\text{Total number of set-ups}}$

= $\frac{\text{Rs.8,20,000}}{\text{64 set-ups}}$ = Rs. 12,812.50

4. *Cost of a purchase order* = $\frac{\text{Total costs related to purchases}}{\text{Total number of purchase order}}$

= $\frac{\text{Rs. 6,18,000}}{\text{544 orders}}$ = Rs. 1,136.03

(i)

Statement showing overhead cost per unit
(based on traditional method of charging overheads)

Products	*Annual output (units)*	*Total machine hours*	*Overhead cost component (Refer to W, Note 1) Rs.*	*Overhead cost per unit Rs.*
A	5,000	20,000	2,84,000	56.80
			(20,000 hrs. × Rs. 14.20)	(Rs. 2,84,000 / 5,000 units)
B	60,000	1,20,000	17,04,000	28.40
			(1,20,000 hrs.×Rs. 14.20)	(Rs.17,04,000/60,000 units)

(ii)

Statement showing overhead cost per unit
(based on activity based costing method)

Products	*Annual output units*	*Total Machine Hours*	*Cost related to volume activities*	*Cost related to purchases*	*Cost related to set-ups*	*Total cost*	*Cost per unit*
			Rs.	*Rs.*	*Rs.*	*Rs.*	*Rs.*
	(a)	*(b)*	*(c)*	*(d)*	*(e)*	*(f) = [(c) + (d) + (e)]*	*(g) = (f)/(a)*
A	5,000	20,000	*78,600 (20,000 hrs × Rs. 3.93)*	*1,81,764.80 (160 orders × Rs. 1136.03)*	*2,56,250 (20 set ups × Rs. 12,812.50)*	*5,16,614.80*	*103.32*
B	60,000	1,20,000	*4,71,600 (1,20,000 hrs × Rs. 3.93)*	*4,36,235.52 (384 orders × Rs. 1136.03)*	*5,63,750 (44 set ups × Rs. 12,812.50)*	*14,71,585.52*	*24.53*

Note: Refer to working notes 2,3 and 4 for computing costs related to volume activities, set-ups and purchases respectively.

Question 53

In the current quarter, a company has undertaken two jobs. The data relating to these jobs are as under:

	Job 1102	*Job 1108*
Selling price	*Rs. 1,07,325*	*Rs. 1,57,920*
Profit as percentage on cost	*8%*	*12%*
Direct Materials	*Rs. 37,500*	*Rs. 54,000*
Direct Wages	*Rs. 30,000*	*Rs. 42,000*

It is the policy of the company to charge Factory overheads as percentage on direct wages and Selling and Administration overheads as percentage on Factory cost.

The company has received a new order for manufacturing of a similar job. The estimate of direct materials and direct wages relating to the new order are Rs. 64,000 and Rs. 50,000 respectively. A profit of 20% on sales is required.

You are required to compute

(i) The rates of Factory overheads and Selling and Administration overheads to be charged.

(ii) The Selling price of the new order *(November, 2002, 9 marks)*

Answer

Working notes

1. Computation of total cost of jobs

Total cost of Job 1102 when 8% is the profit on cost $= \frac{Rs.,1,07,325}{108} \times 100$

$= Rs.\ 99,375$

Total cost of job 1108 when 12% is the profit on cost $= \frac{Rs.\ 1,57,920}{112} \times 100$

$= Rs.\ 1,41,000$

2. Factory overheads = F% of direct wages

Selling & Administrative overheads = A% of factory cost

(i) Computation of rates of factory overheads and selling and administration overheads to be charged.

Jobs Cost Sheet

	Job 1102	*Job 1108*
	Rs.	*Rs.*
Direct materials	37,500	54,000
Direct wages	30,000	42,000
Prime cost	67,500	96,000
Add: Factory overheads	30,000F	42,000F
Factory cost	(67,500 + 30,000 F)	(96,000 + 42,000 F)
(Refer to Working note 2)		
Add: Selling and Administration	(67,500 + 30,000 F) A	(96,000 + 42,000 F) A
Overheads		
(Refer to Working note 2)		
Total cost	(67,500 + 30,000 F)(1 + A)	(96,000 + 42,000 F)(1+A)

Since the total cost of jobs 1102 and 1108 are equal to Rs. 99,375 and Rs. 1,41,000 respectively, therefore we have the following equations *(Refer to working note 1)*

	(67,500 + 30,000 F) (1 + A)	=	99,375	(1)
	(96,000 + 42,000 F) (1 + A)	=	1,41,000	(2)
or	67,500 + 30,000 F + 67,500 A + 30,000 FA	=	99,375	
	96,000 + 42,000 F + 96,000 A + 42,000 FA	=	1,41,000	
or	30,000 F + 67,500 A + 30,000 FA	=	31,875	(3)
	42,000 F + 96,000 A + 42,000 FA	=	45,000	(4)
	On solving (3) and (4) we get : A = 0.25 and F	=	0.40	
	Hence A = 25% and F = 40%			

(ii) Selling price of the new order:

	Rs.
Direct materials	64,000
Direct wages	50,000
Prime cost	1,14,000
Factory overheads *(40% × Rs. 50,000)*	20,000

Factory cost	1,34,000
Selling & Admn. Overheads *(25% × Rs. 1,34,000)*	33,500
Total cost	1,67,500

If selling price of new order is Rs. 100 then Profit is Rs. 20 and Cost is Rs. 80

Hence selling price of the new order = $\frac{\text{Rs.1,67,500}}{80} \times 100$ = Rs. 2,09,375

Question 54

PQR Ltd has its own power plant, which has two users, Cutting Department and Welding Department. When the plans were prepared for the power plant, top management decided that its practical capacity should be 1,50.000 machine hours. Annual budgeted practical capacity fixed costs are Rs.9,00,000 and budgeted variable costs are Rs.4 per machine-hour. The following data are available:

	Cutting Department	*Welding Department*	*Total*
Actual Usage in 2002-03	*60,000*	*40,000*	*1,00,000*
Machine hours)			
Practical capacity for each department (machine hours)	*90,000*	*60,000*	*1,50,000*

Required

(i) Allocate the power plant's cost to the cutting and the welding department using a single rate method in which the budgeted rate is calculated using practical capacity and costs are allocated based on actual usage.

(ii) Allocate the power plant's cost to the cutting and welding departments, using the dual - rate method in which fixed costs are allocated based on practical capacity and variable costs are allocated based on actual usage,

(iii) Allocate the power plant's cost to the cutting and welding departments using the dual-rate method in which the fixed-cost rate is calculated using practical capacity, but fixed costs are allocated to the cutting and welding department based on actual usage. Variable costs are allocated based on actual usage.

(iv) Comment on your results in requirements (i), (ii) and (iii).

(May, 2003) (2+2+2+2=8 marks)

Answer

Working notes:

1. *Fixed practical capacity cost per machine hour:*

Practical capacity (machine hours)	1,50,000
Practical capacity fixed costs (Rs.)	9,00,000
Fixed practical capacity cost per machine hour *(Rs. 9,00,000 / 1,50,000 hours)*	Rs. 6

2. *Budgeted rate per machine hour (using practical capacity):*

   = Fixed practical capacity cost per machine hour + Budgeted variable cost per machine hour

   = Rs. 6 + Rs. 4 = Rs. 10

(i) Statement showing Power Plant's cost allocation to the Cutting & Welding departments by using single rate method on actual usage of machine hours.

	Cutting Department Rs.	*Welding Department* Rs.	*Total* Rs.
Power plants cost allocation by using actual usage (machine hours) *(Refer to working note 2)*	6,00,000 *(50,000 hours × Rs. 10)*	4,00,000 *(40,000 hours × Rs. 10)*	10,00,000

(ii) Statement showing Power Plant's cost allocation to the Cutting & Welding departments by using dual rate method.

	Cutting Department Rs.	*Welding Department* Rs.	*Total* Rs.
Fixed Cost *(Allocated on practical capacity for each department i.e.): (90,000 hours : 60,000 hours)*	5,40,000 $\left(\frac{Rs.9,00,000\times3}{5}\right)$	3,60,000 $\left(\frac{Rs.9,00,000\times2}{5}\right)$	9,00,000
Variable cost *(Based on actual usage of machine hours)*	2,40,000 *(60,000 hours × Rs. 4)*	1,60,000 *(40,000 hours × Rs.4)*	4,00,000
Total cost	7,80,000	5,20,000	13,00,000

(iii) Statement showing Power Plant's cost allocation to the Cutting & Welding Departments using dual rate method

	Cutting Department Rs.	*Welding Department Rs.*	*Total Rs.*
Fixed Cost	3,60,000	2,40,000	6,00,000
Allocation of fixed cost on actual usage basis (Refer to working note 1)	*(60,000 hours × Rs. 6)*	*(40,000 hours × Rs. 6)*	
Variable cost	2,40,000	1,60,000	4,00,000
(Based on actual usage)	*(60,000 hours × Rs. 4)*	*(40,000 hours × Rs. 4)*	
Total cost	6,00,000	4,00,000	10,00,000

(iv) Comments:

Under dual rate method, under (iii) and single rate method under (i), the allocation of fixed cost of practical capacity of plant over each department are based on single rate. The major advantage of this approach is that the user departments are allocated fixed capacity costs only for the capacity used. The unused capacity cost Rs. 3,00,00 (Rs. 9,00,000 – Rs. 6,00,000) will not be allocated to the user departments. This highlights the cost of unused capacity.

Under (ii) fixed cost of capacity are allocated to operating departments on the basis of practical capacity, so all fixed costs are allocated and there is no unused capacity identified with the power plant.

Question 55

"The more kilometers you travel with your own vehicle, the cheaper it becomes." Comment briefly on this statement.

(November, 1995,2 marks)

Answer

The cost per kilometre, (if one travels in his own vehicle) will decline when he travels more kilometers. This is because the majority of costs for running and maintaining vehicles are of fixed nature and the component of fixed cost per kilometre goes on decreasing with an increase in kilometre travel. Hence, the given statement is true.

Question 56

Define Selling and Distribution Expenses. Discuss the accounting for selling and distribution expenses. *(November, 1999, 4 marks)*

Answer

Selling expenses: Expenses incurred for the purpose of promoting, marketing and sales of different products.

Distribution expenses: Expenses relating to delivery and despatch of goods/products to customers.

Accounting treatment for selling and distribution expenses

Selling and distribution expenses are usually collected under separate cost account numbers.

These expenses may be recovered by using any one of following method of recovery.

1. Percentage on cost of production / cost of goods sold.
2. Percentage on selling price.
3. Rate per unit sold.

Question 57

The total overhead expenses of a factory are Rs. 4,46,380. Taking into account the normal working of the factory, overhead was recovered in production at Rs. 1.25 per hour. The actual hours worked were 2,93,104. How would you proceed to close the books of accounts, assuming that besides 7,800 units produced of which 7,000 were sold, there were 200 equivalent units in work-in-progress?

On investigation, it was found that 50% of the unabsorbed overhead was on account of increase in the cost of indirect materials and indirect labour and the remaining 50% was due to factory inefficiency. Also give the profit implication of the method suggested.

(November, 2000, 6 marks)

Answer

		Rs.
Actual factory overhead expenses incurred		4,.46,380
Less: Overhead recovered from production *(2,93,104 hours × Rs. 1.25)*		3,66,380
Unabsorbed overheads		80,000
Reasons for unabsorbed overheads		
(i)	50% of the unabsorbed overhead was on account of increase in the cost of indirect materials and indirect labour	40,000
(ii)	50% of the unabsorbed overhead was due to factory inefficiency.	40,000

Treatment of unabsorbed overheads in cost accounting

1. Unabsorbed overhead amount of Rs.40,000, which was due to increase in the cost of indirect material and labour should be charged to units produced by using a supplementary rate.

$$\text{Supplementary rate} = \frac{\text{Rs. } 40{,}000}{(7{,}800 + 200) \text{ units}} = \text{Rs. } 5 \text{ per unit}$$

The sum of Rs. 40,000 (unabsorbed overhead) should be distributed by using a supplementary rate among cost of sales, finished goods and work-in-progress as below:

	Rs.
Cost of sales *(7,000 units × Rs. 5)*	35,000
Finished goods *(800 units × Rs. 5)*	4,000
Work-in-progress *(200 units × Rs. 5)*	1,000
	40,000

The use of cost of sales figures, would reduce the profit for the period by Rs. 35,000 and will increase the value of stock finished goods and work-in-progress by Rs. 4,000 and Rs. 1,000 respectively.

2. The balance amount of unabsorbed overheads viz. of Rs. 40,000 due to factory inefficiency should be charged to Costing Profit & Loss Account, as this is an abnormal loss.

Question 58

A factory has three production departments: The policy of the factory is to recover the production overheads of the entire factory by adopting a single blanket rate based on the percentage of total factory overheads to total factory wages. The relevant data for a month are given below:

Department	*Direct Materials* Rs.	*Direct Wages* Rs.	*Factory Overheads* Rs.	*Director Labour Hour*	*Machine Hours*
Budget					
Machining	*6,50,000*	*80,000*	*3,60,000*	*20,000*	*80,000*
Assembly	*1,70,000*	*3,50,000*	*1,40,000*	*1,00,000*	*10,000*
Packing	*1,00,000*	*70,000*	*1,25,000*	*50,000*	–

Actual					
Machining	*7,80,000*	*96, 000*	*3,90,000*	*24,000*	*96,000*
Assembly	*1,36,000*	*2,70,000*	*84,000*	*90,000*	*11,000*
Packing	*1,20,000*	*90,000*	*1,35,000*	*60,000*	

The details of one of the representative jobs produced during the month are as under:

Job No. CW 7083

Department	*Direct Materials Rs.*	*Direct Wages Rs.*	*Director Labour Hour*	*Machine Hours*
Machining	*1,200*	*240*	*60*	*180*
Assembly	*600*	*360*	*120*	*30*
Packing	*300*	*60*	*40*	*–*

The factory adds 30% on the factory cost to cover administration and selling overheads and profit.

Required:

(i) Calculate the overhead absorption rate as per the current policy of the company and determine the selling price of the Job No. CW 7083.

(ii) Suggest any suitable alternative method(s) of absorption of the factory overheads and calculate the overhead recovery rates based on the method(s) so recommended by you.

(iii) Determine the selling price of Job CW 7083 based on the overhead application rates calculated in (ii) above.

(iv) Calculate the departmentwise and total under or over recovery of overheads based on the company's current policy and the method(s) recommended by you.

(November, 1994, 16 marks)

Answer

(i) Computation of overhead absorption rate

(as per the current policy of the company)

Department	*Budgeted Factory Overheads Rs.*	*Budged Direct Wages Rs.*
Machinery	3,60,000	80,000
Assembly	1,40,000	3,50,000
Packing	1,25,000	70,000
Total	6,25,000	5,00,000

$$\text{Overhead absorption rate} = \frac{\text{Budgeted factory overheads}}{\text{Budgeted direct wages}} \times 100$$

$$= \frac{\text{Rs.}6,25,000}{\text{Rs.}5,00,000} \times 100$$

= 125% of Direct wages

Selling price of the Job No. CW – 7083

	Rs.
Direct Materials	2,100.00
(Rs. 1,200 + Rs. 600 + Rs. 300	
Direct Wages	660.00
(Rs. 240 + Rs. 360 + Rs. 60)	
Overheads	825.00
(125% × Rs. 660)	
Total factory cost	3,585.00
Add: Mark-up	1,075.50
Selling price	4,660.50

(ii) Methods available for absorbing factory overheads and their overhead recovery rates in different departments.

1. *Machining Department*

In the Machining department, the use of machine time is the predominant factor of production. Hence machine hour rate should be used to recover overheads in this department. The overhead recovery rate based on machine hours has been calculated as under:

$$\text{Machine hour rate} = \frac{\text{Budgeted factory overheads}}{\text{Budgeted machine hours}}$$

$$= \frac{\text{Rs.}3,60,000}{80,000 \text{ hours}}$$

= Rs. 4.50 per hour

2. *Assembly Department*

In this department direct labour hours is the main factor of production. Hence direct labour hour rate method should be used to recover overheads in this department. The overheads recovery rate in this case is:

$$\text{Direct labour hour rate} = \frac{\text{Budgeted factory overheads}}{\text{Budgeted direct labour hours}}$$

$$= \frac{\text{Rs.1,40,000}}{\text{1,00,000 hours}}$$

= Rs. 1.40 per hour

3. *Packing Department*

Labour is the most important factor of production in this department. Hence direct labour hour rate method should be used to recover overheads in this department.

The overhead recovery rate is in this case comes to:

$$\text{Direct labour hour rate} = \frac{\text{Budgeted factory overhead}}{\text{Direct labour hours}}$$

$$= \frac{\text{Rs. 1,25,000}}{\text{50,000 hours}}$$

= Rs. 2.50 per hour

(iii) Selling price of Job CW-7083
[based on the overhead application rates calculated in (ii) above)

	Rs.
Direct materials	2,100.00
Direct wages	660.00
Overheads	1,078.00
(Refer to Working Note)	
Factory cost	3,838.00
Add: Mark up	1,151.40
(30% of Rs. 3,838)	
Selling Price	4,989.40

Working Note

Overhead Summary Statement

Dept.	*Basis*	*Hours*	*Rate*	*Overheads*
			Rs.	*Rs.*
Machining*	Machine hour	180	4.50	810
Assembly	Direct labour hour	120	1.40	168
Packing	Direct labour hour	40	2.50	100
			Total	1,078

(iv) Department-wise statement of total under or over recovery of overheads

(a) Under current policy

	Departments			
	Machining Rs.	*Assembly Rs.*	*Packing Rs.*	*Total Rs.*
Direct Wages (Actual)	96,000	2,70,00	90,000	
Overheads recovered @ 125% of Direct wages: (A)	1,20,000	3,37,500	1,12,500	5,70,000
Actual overheads: (B)	3,90,000	84,000	1,35,000	6,09,000
(Under)/Over recovery of overheads: (A – B)	(2,70,000)	2,53,500	(22,500)	(39,000)

(b) As per methods suggested
Basis of overhead recovery

	Machine hours	*Direct Labour hours*	*Direct labour hours*	*Total Rs.*
Hours worked	96,000	90,000	60,000	
Rate/hour (Rs.)	4.50	1.40	2.50	
Overhead recovered (Rs.): (A)	4,32,000	1,26,000	1,50,000	7,08,000
Actual overheads (Rs.): (B)	3,90,000	84,000	1,35,000	6,09,000
(Under)/Over recovery: (A – B)	42,000	42,000	15,000	99,000

Question 59

(a) Why is the use of an overhead absorption rate based on direct labour hours generally preferable to a direct wages percentage rate for a labour intensive operation?

(November, 1995, 3 marks)

(b) B & Co. has recorded the following data in the two most recent periods:

Total cost of production	*Volume of production*
Rs.	*(Units)*
14,600	*800*
19,400	*1,200*

What is the best estimate of the firm's fixed costs per period? (November, 1995, 3 marks)

(c) *In a manufacturing unit overhead was recovered at a pre-determined rate of Rs.20 per labour-hour. The total factory overhead incurred and the labour-hours actually worked were Rs.45,00,000 and 2,00,000 labour-hours respectively. During this period 30,000 units were sold. At the end of the period 5,000 units were held in stock while there was no opening stock of finished goods. Similarly, though there was no stock of uncompleted units at the beginning of the period, at the end of the period there were 10,000 uncompleted units which may be reckoned at 50% complete.*

On analysing the reasons, it was found that 60% of the unabsorbed over-heads were due to defective planning and rest were attributable to increase in overhead costs.

How would unabsorbed overheads be treated in cost accounts?

(November, 1995, 10 marks)

Answer

(a) A method of overhead absorption is considered appropriate if the total amount of overhead absorbed in a period does not fluctuate materially from the actual expense incurred in the period. Direct wages percentage rate method do not possess the aforesaid features In other words, the overhead charged varies from period to period due to changes in direct wages.

In fact, overhead expenses are generally a function of time. Therefore, a time base overhead absorption rate method is always preferred over any other method. In the case of labour intensive operations, it is advisable to use labour hour method for overhead absorption.

(b)

	Period I	*Period 2*	*Difference*
Total cost of production (Rs.)	14,600	19,400	4,800
Volume of production (units)	800	1,200	400

$$\text{Variable cost per unit} = \frac{\text{Difference in total cost of production}}{\text{Difference in volume of production}}$$

$$= \frac{\text{Rs. } 4{,}800}{400 \text{ units}} = \text{Rs. } 12$$

Fixed cost = Total cost of production (of a period) – Total variable cost

= Rs. 14,600 – 800 units × Rs. 12

= Rs. 14,600 – Rs. 9,600 = Rs. 5,000

(c) *Computation of un-absorbed overheads*

Labour hours actually worked	2,00,00	
		Rs.
Overheads actually incurred : (A)		45,00,000
Overheads absorbed at Rs. 20/- per labour hour (B)		40,00,000
(2,00,000 hours × Rs. 20)		
Unabsorbed overheads: (A – B)		5,00,000
Unabsorbed overheads due to		3,00,000
Defective planning (i.e. 60% of Rs. 5,00,000)		
Balance of unabsorbed overheads due to increase in overhead costs.		2,00,000

Disposition of unabsorbed overhead

(i) The unabsorbed overheads of Rs. 3,00,000 due to defective planning may be treated as abnormal and should therefore be charged to Costing Profit and Loss Account.

(ii) Balance of unabsorbed overheads of Rs. 2,00,000 may be treated as normal and therefore should be charged by a supplementary overhead absorption rate computed as under:

Total production during the year

Units produced	35,000
Add: Equivalent units of work-in-progress	5,000
10,000 units, 50% complete	
Total (units)	40,000

Supplementary overhead absorption rate is:

$$= \frac{\text{Rs.}2,00,000}{40,000} = \text{Rs. } 5/\text{- per unit}$$

Disposition of normal unabsorbed overhead of Rs. 2,00,000

	Rs.
Charge to Costing Profit Loss A/c (as part of cost of unit sold: 30,000 units × Rs. 5)	1,50,000
Add: To closing stock of finished goods: 5,000 finished goods in stock @ Rs. 5 per unit	25,000
Add: To work in progress: 10,000 units, 50% complete i.e. 5,000 equivalent units @ Rs. 5/- per unit	25,000
Total	2,00,000

Question 60

A company is making a study of the relative profitability of the two products – A and B. In addition to direct costs, indirect selling and distribution costs to be allocated between the two products are as under:

	Rs.
Insurance charges for inventory (finished)	*78,000*
Storage costs	*1,40,000*
Packing and forwarding charges	*7,20,000*
Salesmen salaries	*8,50,000*
Invoicing costs	*4,50,000*

Other details are

		Product A	*Product B*
Selling price per unit	*(Rs.)*	*500*	*1,000*
Cost per unit (exclusive of indirect selling and distribution costs)	*(Rs.)*	*300*	*600*
Annual sales in units		*10,000*	*8,000*
Average inventory	*(units)*	*1,000*	*800*
Number of invoices		*2,500*	*2,000*

One unit of product A requires a storage space twice as much as product B. The cost to packing and forwarding one unit is the same for both the products. Salesmen are paid salary plus commission @ 5% on sales and equal amount of efforts are put forth on the sales of each of the product.

Required

(i) Set-up a schedule showing the apportionment of the indirect selling and distribution costs between the two products. (May, 1996, 7 marks)

(ii) Prepare a statement showing the relative profitability of the two products (3 marks)

Answer

(i) Schedule showing the apportionment of the indirect selling and distribution costs between the two products

Items	*Basis of apportionment*	*Total*	*Products*	
			A	*B*
		Rs.	*Rs.*	*Rs.*
Insurance charges	Average inventory value (1000 × Rs. 500) : (800 × Rs.100)	78,000	30,000	48,000

Storage cost	Average Inventory storage space (1000 × 2) : (800 × 1)	1,40,000	1,00,000	40,000
Packing & Forwarding charges	Annual sales in units (10000) : (8000)	7,20,000	4,00,000	3,20,000
Salesmen salaries	Efforts of Salesmen (1:1)	8,50,000	4,25,000	4,25,000
Salesmen Commission	Annual sales value (5:8)	6,50,00	2,50,000	2,50,000
Invoicing Costs	No. of invoices (2500 : 2000)	4,50,000	2,50,000	2,00,000
		28,88,000	14,55,000	14,33,000

(ii) *Statement showing the relative profitability of the two products*

Products	*A* *Rs.*	*B* *Rs.*
Annual sales value	50,00,000	80,00,000
	(10,000 units × Rs. 500)	(8,888 units × Rs. 1000)
Less: Cost of sales	30,00,000	48,00,000
	(10,000 units × Rs. 300)	(8,000 units × Rs. 600)
Gross Profit	20,00,00	32,00,000
Less: Indirect selling and Distribution cost *[Refer to (a)(i)]*	14,55,000	14,33,000
Profit	5,45,000	17,67,000
Profitability as percentage of sales	10.9%	22.08%
	$\left(\frac{Rs.5,45,000}{Rs.50,00,000}\times 100\right)$	$\left(\frac{Rs.17,67,000}{Rs.80,00,000}\times 100\right)$

Question 61

ABC Ltd. manufactures a single product and absorbs the production overheads at a pre-determined rate of Rs. 10 per machine hour.

At the end of financial year 1998-99, it has been found that actual production overheads incurred were Rs. 6,00,000. It included Rs. 45,000 on account of 'written off' obsolete stores and Rs. 30,000 being the wages paid for the strike period under an award.

The production and sales data for the year 1998-99 is as under:

Production:	
Finished goods	*20,000 units*
Work-in-progress	*8,000 units*
(50% complete in all respects)	
Sales:	
Finished goods	*18,000 units*

The actual machine hours worked during the period were 48,000. It has been found that one-third of the under – absorption of production overheads was due to lack of production planning and the rest was attributable to normal increase in costs.

You are required to:

(i) Calculate the amount of under – absorption of production overheads during the year 1998-99; and

(ii) Show the accounting treatment of under – absorption of production overheads.

(November, 1999, 6 marks)

Answer

(i) Amount of under-absorption of production overheads during the year 1998-99

		Rs.
Total production overheads actually incurred during the year 1998-99		6,00,000
Less: 'Written off' obsolete stores	Rs. 45,000	
Wages paid for strike period	Rs. 30,000	75,000
Net production overheads actually incurred: (A)		5,25,000
Production overheads absorbed by 48,000 machines hours @ Rs. 10 per hour: (B)		4,80,000
Amount of under-absorption of production overheads: [(A)–(B)]		45,000

(ii) Accounting treatment of under absorption of production overheads

It is given in the statement of the question that 20,000 units were completely finished and 8,000 units were 50% complete, one third of the under-absorbed overheads were due to lack of production planning and the rest were attributable to normal increase in costs.

		Rs.
1.	(33-1/3% of Rs. 45,000) i.e. Rs. 15,000 of under – absorbed overheads were due to lack of production planning. This being abnormal, should be debited to the Profit and Loss A/c	15,000

2.	Balance (66-2/3% of Rs. 45,000) i.e. Rs. 30,000 of under – absorbed overheads should be distributed over work-in-progress, finished goods and cost of sales by using supplementary rate	30,000
	Total under-absorbed overheads	45,000

Apportionment of unabsorbed overheads of Rs. 30,000 over, work-in-progress, finished goods and cost of sales.

	Equivalent Completed units	*Rs.*
Work-in-progress (4,000 units × Rs. 1.25) *(Refer to working note)*	4,000	5,000
Finished goods *(2,000 units × Rs. 1.25)*	2,000	2,500
Cost of sales *(18,000 units × Rs. 1.25)*	18,000	22,500
	24,000	30,000

Accounting treatment:

Work-in-progress control A/c	Dr.	Rs. 5,000	
Finished goods control A/c	Dr.	Rs. 2,500	
Cost of Sales A/c	Dr.	Rs. 22,500	
Profit & Loss A/c	Dr.	Rs. 15,000	
To Overhead control A/c			45,000

Working note:

$$\text{Supplementary overhead absorption rate} = \frac{\text{Rs. } 30{,}000}{24{,}000 \text{ units}}$$

= Rs. 1.25 per unit

Question 62

Sweat Dreams Ltd. uses a historical cost system and absorbs overheads on the basis of predetermined rate. The following data are available for the year ended 31st March, 1997.

	Rs.
Manufacturing overheads	
Amount actually spent	*1,70,000*
Amount absorbed	*1,50,000*

Cost of goods sold	*3,36,000*
Stock of finished goods	*96,000*
Works-in-progress	*48,000*

Using two methods of disposal of under-absorbed overheads show the implication on the profits of the company under each method. *(Nov., 1997, 8 marks)*

Answer

Computation of unabsorbed overheads:

According to first method, the total unabsorbed overhead amount of Rs. 20,000 will be written off to Costing Profit & Loss Account. The use of this method will reduce the profits of the concern by Rs. 20,000 for the period.

According to second method, a supplementary rate may be used to adjust the overhead cost of each cost unit. The under-absorbed amount in total may, at the end of accounting period be apportioned on proportionate basis over cost of goods sold; stock of finished goods and work-in-progress. Apportionment of under-absorbed overheads may be carried out on the basis of the value of cost of goods sold, stock of finished goods and work-in-progress. Prorated figures of under-absorbed overhead over cost of goods sold; stock of finished goods and work-in-progress in this question, on the basis of values of the balances in each of these accounts are as follows:

		Appointment of overhead under absorbed (Refer to working note)	
	Rs.	*Rs.*	*Rs.*
Cost of goods sold	3,36,000	14,000	3,50,000
Stock of finished goods	96,000	4,000	1,00,000
Work-in-progress	48,000	2,000	50,000
	4,80,000	20,000	5,00,000

The use of the above method would reduce the profit of the concern by Rs. 14,000.

Working note:

Under-absorbed overhead to be absorbed by cost of goods sold $= \frac{Rs.3,36,000}{Rs.4,80,000} \times Rs.\ 20,000 = Rs.\ 14,000$

Under-absorbed overheads to be absorbed by stock of finished goods $= \frac{Rs.96,000}{Rs.4,80,000} \times Rs.\ 20,000 = Rs.\ 4,000$

Under-absorbed overhead to be absorbed by WIP $= \frac{Rs.48,000`}{Rs.4,80,000} \times Rs.\ 20,000 = Rs.\ 2,000$

Question 63

In a factory, a machine is considered to work for 208 hours in a month. It includes maintenance time of 8 hours and set up time of 20 hours.

The expense data relating to the machine are as under:

– *Cost of the machine is Rs. 5,00,000. Life 10 years. Estimated scrap value at the end of life is Rs. 20,000.*

	Rs.
– *Repairs and maintenance per annum*	*60,480*
– *Consumable stores per annum*	*47,520*
– *Rent of building per annum (The machine under reference occupies 1/6 of the area)*	*72,000*
– *Supervisor's salary per month (Common to three machines)*	*6,000*
– *Wages of operator per month per machine*	*2,500*
– *General lighting charges per month allocated to the machine*	*1,000*
– *Power 25 units per hour at Rs. 2 per unit*	

Power is required for productive purposes only. Set up time, though productive, does not require power. The Supervisor and Operator are permanent. Repairs and maintenance and consumable stores vary with the running of the machine.

Required

Calculate a two-tier machine hour rate for (a) set up time, and (b) running time

(May, 2002, 8 marks)

Answer

Working notes:

1. (i) *Effective hours for standing charges (208 hours – 8 hours)* 200

(ii) *Effective hours for variable costs (208 hours – 28 hours)* 180

2. Standing charges per hour

	Per month Rs.	*Per hour Rs.*
Supervisor's salary *(Rs. 6,000 / 3 machines)*	2,000	

General Lighting	1,000	
Rent	1,000	
(Rs. 72,000 / 6 × 12)		
Total standing charges	4,000	
Standing charges per hour		20
(Rs. 4,000 / 200 hours)		

3. Machine expenses per hour

	Per month Rs.	*Per hour* Rs.
Depreciation (Rs. 5,00,000 – Rs. 20,000) / (10 years × 12 months)	4,000	20 (Rs. 4,000 / 200 hours
Repairs & maintenance Rs. 60,480 / 12 months)	5,040	28 (Rs. 5,040 / 180 hours)
Consumable stores (Rs. 47,520 / 12 months)	3,960	22 (Rs. 3,960 / 180 hours)
Power (25 units × Rs. 2 × 180 hours)	9,000	50 (Rs. 9,000 / 180 hours)
Wages	2,500	12.50 (Rs. 2,500 / 200 hours)
Total machine expenses	24,500	132.50

Computation of Two – tier machine hour rate

	Set up time rate per machine hour Rs.	*Running time rate per machine hour* Rs.
Standing Charges *(Refer to working note 2)*	20.00	20.00
Machine expenses: *(Refer to working note 3)*		
Depreciation	20.00	20.00
Repair and maintenance	–	28.00
Consumable stores	–	22.00
Power	–	50.00
Machine hour rate of overheads	40.00	140.00
Wages	12.50	12.50
Comprehensive machine hour rate	52.50	152.50

Question 64

A machine was purchased January 1,1990, for 5 lakhs. The total cost of all machinery inclusive of the new machine was Rs. 75 lakhs. The following further particulars are available:

Expected life of the machine 10 years.

Scrap value at the end of ten years Rs. 5,000.

Repairs and maintenance for the machine during the year Rs. 2,000 Expected number of working hours of the machine per year, 4,000 hours Insurance premium annually for all the machines Rs. 4,500

Electricity consumption for the machine per hour (@ 75 paise per unit) 25 units.

Area occupied by the machine 100 sq.ft.

Area occupied by other machine 1,500 sq.ft.

Rent per month of the department Rs. 800.

Lighting charges for 20 points for the whole department, out of which three points are for the machine Rs. 120 per month.

Compute the machine hour rate for the new machine on the basis of the data given above.

Answer

(c) **Computation of Machine Hour Rate**

Standing charges	*Rs. (p.a.)*	*Rs. (per hour)*
Depreciation *(See Note 1)*	49,500	
Insurance premium *(See Note 2)*	300	
Repair and Maintenance	2,000	
Rent *(See Note 3)*	600	
Light Charges *(See Note 4)*	216	
Total Standing Charges	52,616	
Hours rate for Standing Charges *(Rs. 52,616 / 4,000 hours)*		13,154
Machine Expenses:		
Electricity Consumption: 25 units p.h. @ 0.75p p.u.		18.75
Machine hour rate		31.904

Note:

		Rs.
(1)	Cost of new machine:	5,00,000
	Less: Scrap Value	5,000.00

Net Cost of the machines 4,95,000
Life of the machine 10 years:

$$\text{Depreciation} = \frac{\text{Rs. } 4,95,000}{10 \text{ years}} = \text{Rs. } 49,500$$

(2) Total cost of all the machines 75,00,000
Total Insurance premium paid for all the machines 4,500
Total annual insurance premium of the

$$\text{new Machine} = \frac{\text{Rs. } 4,500 \times \text{Rs. } 5,00,000}{\text{Rs. } 75,00,000}$$

$$= \text{Rs. } 300$$

(3) Rent paid per annum = Rs. 9,600
Toal Area occupied = 1600 Sq.Ft.
Rent for the area occupied by

$$\text{New machine (100 sq.ft.)} = \frac{\text{Rs. } 9,600 \times 100 \text{ sq.ft.}}{1,600 \text{ sq.ft.}}$$

$$= \text{Rs. } 600$$

(4) Total annual light charges of 20
Points for the whole department is Rs. 1,440.

$$\text{Light charges for the machine p.a.} = \frac{\text{Rs. } 1,440 \times 3 \text{ points}}{20 \text{ points}} = \text{Rs. } 216.$$

Question 65

A company has three production departments and two service departments. Distribution summary of overheads is as follows:

Production Departments	
A	*Rs. 13,600*
B	*Rs. 14,700*
C	*Rs. 12,800*
Service Departments	
X	*Rs. 9,000*
Y	*Rs. 3,000*

The expenses of service departments are charged on a percentage basis which is as follows:

	A	B	C	*X*	*Y*
X Deptt.	*40%*	30%	20%	–	*10%*
Y Deptt.	*30%*	30%	20%	20%	–

Apportion the cost of Service Departments by using the Repeated Distribution method.
(November, 1998, 8 marks)

Answer

Statement showing apportionment of the cost of Service Departments to Production Departments by using the Repeated Distribution Method.

	Production Departments			*Service Departments*	
	A	*B*	*C*	*X*	*Y*
	Rs.	*Rs.*	*Rs.*	*Rs.*	*Rs.*
Total overheads as per distribution summary	*13,600*	14,700	12,800	9,000	*3,000*
Department X overheads apportioned in the ratio of (40:30:20:-:10)	*3,600*	2,700	1,800	-9,000	*900*
Department Y overheads apportioned in the ratio of (30:30:20:20:-)	*1,170*	1,170	780	780	*-3,900*
Department X overheads apportioned in the ratio of (40:30:20:20:-:10)	*312*	234	156	-780	*78*
Department Y overheads apportioned in the ratio of (30:30:20:20:-)	*23*	23	16	16	*-78*
Department X overheads apportioned in the ratio of (40:30:20:-:10)	*6*	5	3	-16	*2*
Department Y overheads apportioned in the ratio of (30:30:20: 20:-)	*1*	1	—	—	*-2*
	18,712	18,833	15,555	—	—

Question 66

What is idle time? Explain the causes leading to idle time and its treatment in cost accounts?

Answer

Idle time : It refer to the labour time paid for but not utilized on production .In other words it represents the time for which wages are paid, but during which no output is given out by the workers .This is the period during which workers remain idle . Idle time may be normal or abnormal . Normal idle time is the time, which cannot be avoided or reduced, in normal course of business. Abnormal idle time is the time, which arises on account of abnormal causes. Such idle time is uncontrollable.

Causes leading to idle time: The major causes, which account for idle time may be grouped under the following two heads:

Normal causes: The main causes, which lead to the occurrence of normal idle time, are as follow

1. Time taken by workers to travel the distance between the main gate of factory and the place pf their work.
2. Time lost between the finish of one job and starting of next job.
3. Time spent to overcome fatigue.
4. Time spent to meet their personal needs like taking lunch, tea etc.

Abnormal causes: The main causes, which account for the occurrence of abnormal idle time, are:

1. Machine break- down, power failure, non-availability of raw materials, tools or waiting for jobs due to defective planning.
2. Conscious management policy decision to stop work for some time.
3. In the case of seasonal goods producing units may not be possible for them to produce evenly throughout the year. Such a factor too, it result in the generation of abnormal idle time.

Treatment of Idle time in Cost Accounts:

Normal idle time: The cost of normal idle time should be charged to the cost of production. This is done by inflating the labour rate. It may be transferred to factory overheads for absorption, by adopting a factory overhead absorption rate.

Abnormal Idle time: The cost of abnormal idle time due to any reason should be charged to Costing Profit & Loss Account.

Question 67

Indicate the base or bases that you would recommend to apportion overhead costs to production department:

(i) Supplies	*(ii) Repairs*
(iii) Maintenance of building	*(iv) Executive salaries*
(v) Rent	*(vi) Power and light*
(vii) Fire insurance	*(vii) Indirect labour.*

Answer

	Item	**Bases of apportionment**
(i)	Supplies	Actual supplies made to different departments
(ii)	Repair	Direct labour hours; Machine hours; Direct labour wages; Plant value.
(iii)	Maintenance of building	Floor area occupied by each department
(iv)	Executive salaries	Actual basis; Number of workers.
(v)	Rent	Floor area

(vi) Power and light	K W hours or H P (power) Number of light points; Floor space; Meter readings (light)
(vii) Fire insurance	Capital cost of plant and building; Value of stock
(viii) Indirect labour	Direct labour cost.

Question 68

Your company uses a historical cost system and applies overheads on the basis of "pre-determined" rates. The following are the figure from the Trial Balance as at 30-9-83:-

Manufacturing overheads	*Rs. 4,26,544 Dr.*
Manufacturing overheads applied	*Rs. 3,65,904 Cr.*
Work-in-progress	*Rs. 1,41,480 Dr.*
Finished goods stocks	*Rs. 2,30,732 Dr.*
Cost of goods sold	*Rs. 8,40,588 Dr.*

Give two methods for the disposal of the unabsorbed overheads and show the profit implications of each method.

Answer

Actual overheads	Rs. 4,26,544
Overhead recovered	Rs. 3,65,904
Under absorbed Overhead	Rs. 60,640

The two methods for the disposal of the under-absorbed overheads in this problem may be:-

(1) Write off the under – absorbed overhead to Costing Profit & Loss Account.

(2) Use supplementary rate, to recover the under-absorbed overhead.

According to first method, the total unabsorbed overhead amount of Rs. 60,640 will be written off to Costing Profit & Loss Account. The use of this method will reduce the profits of the concern by Rs. 60,640 for the period.

According to second method, a supplementary rate may be used to adjust the overhead cost of each cost unit. The under-absorbed amount in total may, at the end of the accounting period, be apportioned on ratio basis to the three control accounts, viz, work-in-progress, finished goods stock and cost of goods sold account. Apportioning of under-absorbed overhead can be carried out by using direct labour hours/machine hours/the value of the balances in each of these accounts, as the basis. Prorated figures of under-absorbed overhead over work-in-progress, finished goods stock and cost of goods sold in this question on the basis of values, of the balances in each of these accounts are as follows:-

		Additional Overhead (Under-absorbed)	*Total*
	Rs.	*Rs.*	*Rs.*
Work-in-progress	1,41,480	7,074*	1,48,554
Finished Goods Stock	2,30,732	11,537**	2,42,269

Cost of Goods Sold	8,40,588	42,029***	8,82,617
	12,12,800	60,640	12,73,440

By using this method, the profit for the period will be reduced by Rs. 42,029 and the value of stock will increase by Rs. 18,611. The latter will affect the profit of the subsequent period.

Working Notes

The apportionment of under-absorbed overhead over work-in-progress, finished goods stock and cost of goods sold on the basis of their value in the respective account is as follows:-

*Overhead to be absorbed by work-in-progress $= \frac{\text{Rs. } 60,640}{12,12,800} \times 1,41,480 = \text{Rs. } 7,074$

**Overhead to be absorbed by finished goods $= \frac{\text{Rs. } 60,640}{12,12,800} \times 2,30,732 = \text{Rs. } 11,537$

***Overhead to be absorbed by cost of goods sold $= \frac{\text{Rs. } 60,640}{12,12,800} \times 8,40,588 = \text{Rs. } 42,029$

Question 69

Distinguish between cost allocation and cost absorption.

Answer

Cost allocation and Cost Absorption: Cost allocation is defined as the allotment of whole items of cost to cost centers. For example, if a typist works exclusively for Board of Studies, then the salary paid to him should be charged to Board of Studies account. This technique of charging the entire overhead expenses to a cost centre is known as cost allocation.

Cost absorption is defined as the process of absorbing all overhead costs allocated to or apportioned over particular cost centre or production department by the units produced. For example, the overhead costs of a lathe centre may be absorbed by a rate per lathe hour.

Cost absorption can take place only after cost allocation. In other words, the overhead costs are either allocated or apportioned over different cost centres and afterwards they are absorbed on equitable basis by the output of the same cost centres.

Question 70

A factory manufactures only one product in one quality and size. The owner of the factory states that he has a sound system of financial accounting which can provide him with unit cost information and as such he does not need a cost accounting system. State your arguments to convince him the need to introduce a cost accounting system. (Nov, 1996, 4 marks)

Answer

Definition of Administration overhead: These are costs of formulating the policy, directing the organisation and controlling the operation of an undertaking. These are not related directly to production activity or function. In other words, all expenses incurred on policy formulation, direction, control, office administration and business management are included in administration overheads.

Treatment of Administrative Overheads in Cost Accounting

(i) *Charge to Costing Profit and Loss Account:* According to this method administration overheads should be treated as fixed cost as they are concerned with the formulation of policy. Hence these overheads should be transferred to the costing profit and account.

(ii) *Apportionment between production and selling and distribution:* According to this method it is assumed that administrative overheads are incurred both for production and for selling and distribution. Therefore these overheads should be divided on equitable basis between production and selling and distribution activity.

(iii) *Treat as a separate element of total cost:* Here administration overhead considered as a cost of a distinct and identifiable operation of the organisation necessary to carry on its activity. Therefore these overheads are recovered separately on some equitable basis which may be cost or sales basis.

Question 71

An engine manufacturing company has two production departments: (i) Snow mobile engine and (ii) Boat engine and two service departments: (i) Maintenance and (ii) Factory office. Budgeted cost data and relevant cost drivers are as follows:

Departmental costs:	*Rs.*
Snow mobile engine	*6,00,000*
Boat engine	*17,00,000*
Factory office	*3,00,000*
Maintenance	*2,40,000*
Cost drivers:	
Factory office department:	*No. of employees*
Snow mobile engine department	*1,080 employees*
Boat engine department	*270 employees*
Maintenance department	*150 employees*
	1,500 employees

Maintenance department:	*No. of work orders*
Snow mobile engine department	*570 orders*
Boat engine department	*190 orders*
Factory office department	*40 orders*
	800 orders

Required:

(i) Compute the cost driver allocation percentage and then use these percentage to allocate the service department costs by using direct method.

(ii) Compute the cost driver allocation percentage and then use these percentage to allocate the service department costs by using non-reciprocal method/step method.

(2+3= 5 marks)

Answer 71

(i) Cost Driver Allocation percentage

Factory office dept.	*Number of employees*	*Percent used*
Snowmobile engine	1,080	80%
Boat engine	270	20%
Total	1,350	100%

Maintenance dept	Number of work orders	
Snowmobile engine	570	75%
Boat engine	190	25%
	760	100

Service department allocation:

	Factory office dept.	*Maintenance dept.*	*Snowmobile engine*	*Boat engine*
Departmental Cost	Rs. 3,00,000	Rs. 2,40,000	Rs. 6,00,000	Rs. 17,00,000
Allocated costs (Rs):				
Factory office Dept.	(3,00,000)	-	2,40,000	60,000
Maintenance Dept.	-	(2,40,000)	1,80,000	60,000
Total	0	0	10,20,000	18,20,000

(ii) Cost Driver allocation percentage

Factory office dept	*Number of employees*	Percent used
Snowmobile engine	1,080	72%
Boat engine	270	18%
Maintenance dept	150	10%
	1,500	100%
Maintenance dept	Work order	Percent used
Snowmobile engine	570	75%
Boat engine	190	25%
	760	100%

Service department allocation:

	Factory office Dept.	*Maintenance Dept.*	*Snowmobile engine*	*Boat engine*
Departmental costs	Rs. 3,00,000	Rs. 2,40,000	Rs. 6,00,000	Rs. 17,00,000
Allocated costs (Rs):				
Factory office	(3,00,000)	30,000	2,16,000	54,000
Maintenance dept	-	(2,70,000)	20,2500	67,500
Total cost	0	0	10,18,500	18,21,500

Question 72

A manufacturing unit has purchased and installed a new machine of Rs. 12,70,000 to its fleet of 7 existing machines. The new machine has an estimated life of 12 years and is expected to realise Rs. 70,000 as scrap at the end of its working life. Other relevant data are as follows:

(i) Budgeted working hours are 2,592 based on 8 hours per day for 324 days. This includes 300 hours for plant maintenance and 92 hours for setting up of plant.

(ii) Estimated cost of maintenance of the machine is Rs. 25,000 (p.a.).

(iii) `The machine requires a special chemical solution, which is replaced at the end of each week (6 days in a week) at a cost of Rs. 400 each time.

(iv) Four operators control operation of 8 machines and the average wages per person amounts to Rs. 420 per week plus 15% fringe benefits.

(v) Electricity used by the machine during the production is 16 units per hour at a cost of Rs. 3 per unit. No current is taken during maintenance and setting up.

(vi) Departmental and general works overhead allocated to the operation during last year was Rs. 50,000. During the current year it is estimated to increase 10% of this amount.

Calculate machine hour rate, if (a) setting up time is unproductive; (b) setting up time is productive. (2+3= 5 marks)

Answer 72

Computation of Machine hour Rate

	Per year	*Per hour (unproductive)*	*Per hour (productive)*
Standing charges			
Operators wages			
4× 420 × 54	90,720		
Add: Fringe Benefits 15%	13,608		
	1,04,328		
Departmental and general overhead			
(50,000 + 5,000)	55,000		
Total Std. Charging for 8 machines	1,59,328		
Cost per Machine 1,59,328/8	19,916		
Cost per Machine hour 19,916/2,200		9.05	
19,916/2,292			8.69
Machine hours:			
Setting time unproductive (2,592-300-92) = 2200			
Setting time productive (2,592-300) = 2,292			
Machine expenses			
Depreciation (12,70,000 -70,000)/(12 ×2,200)		45.45	
(12,70,000-70,000)/(12 × 2,292)			43.63
Electricity (16× 3)		48.00	
(16×3×2,200)/2,292)			46.07
Special chemical solution (400 × 54)/2,200,/ 2,292		9.82	9.42
Maintenance (25,000/2,200)		11.36	
(25,000/2,292)			10.91
Machine Hour Rate		123.68	118.72

Question 73

From the details furnished below you are required to compute a comprehensive machine-hour rate:

Original purchase price of the machine (subject to depreciation at 10% per annum on original cost)		*Rs. 3,24,000*
Normal working hours for the month (The machine works to only 75% of capacity)		*200 hours*
Wages of Machineman	*Rs. 125 per day (of 8 hours)*	
Wages for Helper (machine attendant)	*Rs. 75 per day (of 8 hours)*	
Power cost for the month for the time worked		*Rs. 15,000*
Supervision charges apportioned for the machine centre for the month		*Rs. 3,000*
Electricity & Lighting for the month		*Rs. 7,500*
Repairs & maintenance (machine) including		
Consumable stores per month		*Rs. 17,500*
Insurance of Plant & Building (apportioned) for the year		*Rs. 16,250*
Other general expense per annum		*Rs. 27,500*

The workers are paid a fixed Dearness allowance of Rs. 1,575 per month. Production bonus payable to workers in terms of an award is equal to 33.33% of basic wages and dearness allowance. Add 10% of the basic wage and dearness allowance against leave wages and holidays with pay to arrive at a comprehensive labour-wage for debit to production. (14 Marks)

Answer

Computation of Comprehensive Machine Hour Rate

	Per month(Rs)	**Per hour(Rs)**
Fixed cost		
Supervision charges	3,000	
Electricity and lighting	7,500	
Insurance of Plant and building (16,250×1/12)	1,354.17	

Other General Expenses (27,500×1/12)	2,291.67	
Depreciation (32,400×1/12)	2,700	
	16,845.84	112.31
Variable Cost		
Repairs and maintenance	17,500	116.67
Power	15,000	100.00
Wages of machine man		44.91
Wages of Helper		32.97
Machine Hour rate (Comprehensive)		Rs406.86

Effective machine working hour's p.m.

200 hrs. × 75% = 150 hrs.

Wages per machine hour

	Machine man	**Helper**
Wages for 200 hours		
(Rs. 125× 25)	Rs. 3,125	
(Rs. 75× 25)		Rs. 1,875
D.A.	Rs. 1,575	Rs. 1,575
	Rs. 4,700	Rs. 3,450
Production bonus (1/3 of above)	1,567	1,150
	6,267	4,600
Leave wages (10%)	470	345
	6,737	4,945
Effective wage rate per machine hour (150 hrs in all)	Rs. 44.91	Rs. 32.97

Question 74

RST Ltd. has two production departments: Machining and Finishing. There are three service departments: Human Resource (HR), Maintenance and Design. The budgeted costs in these service departments are as follows:

	HR	*Maintenance*	*Design*
	Rs.	*Rs.*	*Rs.*
Variable	*1,00,000*	*1,60,000*	*1,00,000*
Fixed	*4,00,000*	*3,00,000*	*6,00,000*
	5,00,000	*4,60,000*	*7,00,000*

The usage of these Service Departments' output during the year just completed is as follows:

Provision of Service Output (in hours of service)

	Providers of Service		
Users of Service	*HR*	*Maintenance*	*Design*
HR	–	–	–
Maintenance	*500*	–	–
Design	*500*	*500*	–
Machining	*4,000*	*3,500*	*4,500*
Finishing	*5,000*	*4,000*	*1,500*
Total	*10,000*	*8,000*	*6,000*

Required:

(i) Use the direct method to re-apportion RST Ltd.'s service department cost to its production departments.

(ii) Determine the proper sequence to use in re-apportioning the firm's service department cost by step-down method.

(iii) Use the step-down method to reapportion the firm's service department cost.

Answer

(i) Apportionment of Service Department Overheads amongst production departments using Direct Method:

	Production Deptts.		**Service Deptts.**		
	Machining	*Finishing*	*HR*	*Maintenance*	*Design*
	Rs.	Rs.	Rs.	Rs.	Rs.
Overhead as per primary distribution			5,00,000	4,60,000	7,00,000
Apportionment design 4,500 : 1,500	5,25,000	1,75,000			
Maintenance 3,500 : 4,000	2,14,667	2,45,333			
HR 4,000 : 5,000	2,22,222	2,77,778			
	9,61,889	6,98,111			

(ii) The proper sequence for apportionment of service department overheads is

First	HR
Second	Maintenance
Third	Design

The sequence has been laid down based on service provided.

(iii) Apportionment of Service Department overheads amongst production departments using step-down method.

	Production Department		Service Department		
	Machining	*Finishing*	*HR*	*Maintenance*	*Design*
	Rs.	*Rs.*	*Rs.*	*Rs.*	*Rs.*
Overhead as per primary distribution	–	–	5,00,000	4,60,000	7,00,000
Apportionment HRD 4 : 5 : – : 0.5 : 0.5	2,00,000	2,50,000	(–)5,00,000	25,000	25,000
Maintenance 7 : 8: –: 1	2,12,188	2,42,500	–	(–)4,85,000	30,312
Design 3 : 1	5,66,484	1,88,828	–	–	(–)7,55,312
	9,78,672	6,81,328			

Question 75

ABC Ltd. has three production departments P_1, P_2 and P_3 and two service departments S_1 and S_2. The following data are extracted from the records of the Company for the month of October, 2007:

	Rs.
Rent and rates	*62,500*
General lighting	*7,500*
Indirect Wages	*18,750*
Power	*25,000*
Depreciation on machinery	*50,000*
Insurance of machinery	*20,000*

Other Information:

	P_1	P_2	P_3	S_1	S_2
Direct wages (Rs.)	*37,500*	*25,000*	*37,500*	*18,750*	*6,250*
Horse Power of Machines used	*60*	*30*	*50*	*10*	–
Cost of machinery (Rs.)	*3,00,000*	*4,00,000*	*5,00,000*	*25,000*	*25,000*
Floor space (Sq. ft)	*2,000*	*2,500*	*3,000*	*2,000*	*500*

Number of light points	*10*	*15*	*20*	*10*	*5*
Production hours worked	*6,225*	*4,050*	*4,100*	*–*	*–*

Expenses of the service departments S_1 and S_2 are reapportioned as below:

	P_1	P_2	P_3	S_1	S_2
S_1	*20%*	*30%*	*40%*	*–*	*10%*
S_2	*40%*	*20%*	*30%*	*10%*	*–*

Required:

(i) Compute overhead absorption rate per production hour of each production department.

(ii) Determine the total cost of product X which is processed for manufacture in department P_1, P_2 and P_3 for 5 hours, 3 hours and 4 hours respectively, given that its direct material cost is Rs. 625 and direct labour cost is Rs. 375.

(November 2007, 10 Marks)

Answer

(i) Primary Distribution Summary

Item of cost	*Basis of apportionment*	*Total (Rs.)*	P_1 *(Rs.)*	P_2 *(Rs.)*	P_3 *(Rs.)*	S_1 *(Rs.)*	S_2 *(Rs.)*
Rent and Rates	Floor area 4 : 5 : 6 : 4 : 1	62,500	12,500	15,625	18,750	12,500	3,125
General lighting	Light points 2 : 3 : 4 : 2 : 1	7,500	1,250	1,875	2,500	1,250	625
Indirect wages	Direct wages 6 : 4 : 6 : 3 : 1	18,750	5,625	3,750	5,625	2812.5	937.5
Power	Horse Power of machines used 6 : 3 : 5 : 1	25,000	10,000	5,000	8,333	1,667	–
Depreciation of machinery	Value of machinery 12 : 16 : 20 : 1 : 1	50,000	12,000	16,000	20,000	1,000	1,000
Insurance of machinery	Value of machinery	20,000	4,800	6,400	8,000	400	400

12 : 16 : 20 : 1 : 1						
	1,83,750	46,175	48,650	63,208	19,630	6,088

Overheads of service cost centres Let S_1 be the overhead of service cost centre S_1 and S_2 be the overhead of service cost centre S_2.

$S_1 = 19,630 + 0.10\ S_2$

$S_2 = 6,088 + 0.10\ S_1$

Substituting the value of S_2 in S_1 we get

$S_1 = 19,630 + 0.10\ (6,088 + 0.10\ S_1)$

$S_1 = 19,630 + 608.8 + 0.01\ S_1$

$0.99\ S_1 = 20,238.8$

$\therefore S_1$ = Rs. 20,443.

$\therefore S_2$ = 6,088 + 0.10 × 20,443.

= Rs. 8,132.

Secondary Distribution Summary

Particulars	*Total*	*P_1*	*P_2*	*P_3*
	Rs.	*Rs.*	*Rs.*	*Rs.*
Allocated and Apportioned overheads as per primary distribution	1,58,033	46,175	48,650	63,208
S_1	20,443	4,089	6,133	8,177
S_2	8,132	3,253	1,626	2,440
		53,517	56,409	73,825

Overhead rate per hour

	P_1	*P_2*	*P_3*
Total overheads cost	Rs. 53,517	Rs. 56,409	Rs. 73,825
Production hours worked	6,225	4,050	4,100
Rate per hour (Rs.)	Rs. 8.60	Rs. 13.93	Rs. 18.01

(ii) Cost of Product X

Direct material	Rs. 625
Direct labour	Rs. 375
Prime cost	Rs. 1,000

Production on overheads		
P_1	5 hours × Rs. 8.60 = 43	
P_2	3 hours × Rs. 13.93 = 41.79	
P_3	4 hours × Rs. 18.01 = 72.04	Rs. 156.83
Factory cost		Rs. 1,157

Question 76

PQR manufacturers – a small scale enterprise produces a single product and has adopted a policy to recover the production overheads of the factory by adopting a single blanket rate based on machine hours. The budgeted production overheads of the factory are Rs. 10,08,000 and budgeted machine hours are 96,000.

For a period of first six months of the financial year 2007–2008, following information were extracted from the books:

Actual production overheads	Rs. 6,79,000
Amount included in the production overheads:	
Paid as per court's order	*Rs. 45,000*
Expenses of previous year booked in current year	*Rs. 10,000*
Paid to workers for strike period under an award	*Rs. 42,000*
Obsolete stores written off	*Rs. 18,000*

Production and sales data of the concern for the first six months are as under:

Production:	
Finished goods	*22,000 units*
Works-in-progress (50% complete in every respect)	*16,000 units*
Sale:	
Finished goods	*18,000 units*

The actual machine hours worked during the period were 48,000 hours. It is revealed from the analysis of information that ¼ of the under-absorption was due to defective production policies and the balance was attributable to increase in costs.

You are required:

(i) to determine the amount of under absorption of production overheads for the period,

(ii) to show the accounting treatment of under-absorption of production overheads, and

(iii) to apportion the unabsorbed overheads over the items. (May 2008, 10 Marks)

Answer

(i) Amount of under absorption of production overheads during the period of first six months of the year 2007-2008:

		Amount (Rs.)
Total production overheads actually incurred during the period		*6,79,000*
Less*: Amount paid to worker as per*	*45,000*	
Expenses of previous year booked	*10,000*	
Wages paid for the strike period	*42,000*	
Obsolete material written off	*18,000*	*1,15,000*
		5,64,000
Less*: Production overheads absorbed*	*(48,000 hours * Rs. 10.50)*	*5,04,000*
Amount of under absorbed production overheads		*60,000*

$$\text{Budgeted Machine hour rate} = \frac{\text{Rs.}10,08,000}{96,000\,\text{hours}} = \text{Rs.}10.50\,\text{per hour}$$

(ii) Accounting treatment of under absorbed production overheads:

As, one fourth of the under absorbed overheads were due to defective production policies, this being abnormal, hence should be debited to Profit and Loss Account.

Amount to be debited to Profit and Loss Account = (60,000 * ¼) Rs. 15,000.

Balance of under absorbed production overheads should be distributed over Works in progress, finished goods and cost of sales by applying supplementary rate*.

Amount to be distributed = (60,000 * ¾) Rs. 45,000.

$$\text{Supplementary rate} = \frac{\text{Rs.}45,000}{30,000\,\text{units}} = \text{Rs.}1.50\,\text{per unit}$$

(iii) Apportionment of under absorbed production overheads over WIP, finished goods and cost of sales:

	Equivalent completed units	*Amount (in Rs.)*
*Work-in-Progress (16,000 units *50%*1.50)*	*8,000*	*12,000*
*Finished goods (4,000 units *1.50)*	*4,000*	*6,000*
*Cost of sales (18,000 units *1.50)*	*18,000*	*27,000*
Total	*30,000*	*45,000*

Question 77

In a manufacturing company factory overheads are charged as fixed percentage basis on direct labour and office overheads are charged on the basis of percentage of factory cost. The following informations are available related to the year ending 31st March, 2008 :

	Product A	Product B
Direct Materials	Rs. 19,000	Rs. 15,000
Direct Labour	Rs. 15,000	Rs. 25,000
Sales	Rs. 60,000	Rs. 80,000
Profit	25% on cost	25% on sales price

You are required to find out:

(i) The percentage of factory overheads on direct labour.

(ii) The percentage of office overheads on factory cost (November 2008, 6 Marks)

Answer

Let, the percentage of factory overheads on direct labour is 'x' and the percentage of office overheads on factory cost is 'y', then the total cost of product A and product B will be as follows:

	Product A (Rs.)	Product B (Rs.)
Direct Materials	19,000	15,000
Direct labour	15,000	25,000
Prime Cost	34,000	40,000
Factory overheads (Direct labour × x)	150 x	250 x
Factory cost (i)	34,000 + 150 x	40,000 + 250 x
Office overheads (Factory cost × y) (ii)	340 y + 1.5 x y	400 y + 2.5 x y
Total Cost [(i) + (ii)]	34,000 + 150 x + 340 y + 1.5 x y	40,000 + 250 x +400 y + 2.5 x y

Total cost on the basis of sales is:

	Product A (Rs.)	Product B (Rs.)
Sales	*60,000*	*80,000*
Less*: Profit*		
Product A – 25% on cost or 20% on Sales	*12,000*	
Product B – 25% on sales	_____	*20,000*
Total Cost	*48,000*	*60,000*

Thus,

Total Cost of A is 34,000 + 150x + 340y + 1.5 xy = 48,000

or 150x + 340y + 1.5 xy = 14,000……(i)

Total Cost of B is 40,000 + 250x + 400y + 2.5 xy = 60,000

or 250x + 400y + 2.5 xy = 20,000…… .(ii)

Equation (ii) multiplied by 0.6 and after deducting from equation (i), we get

150x + 340y + 1.5xy = 14,000……(i)

_150x ± 240y ±1.5xy = _12,000……..(ii)

100y = 2,000

or y = 20

Putting value of y in equation (i), we get

150x + 340 × 20 + 1.5x × 20 = 14,000

or 150x + 30x = 14,000 – 6,800

or 180x = 7,200

or x = 40.

Hence, **(i)** the percentage of factory overheads on direct labour = 40 and

(ii) the percentage of office overheads on factory cost = 20.

Question 78

Maximum production capacity of JK Ltd. is 5,20,000 units per annum. Details of estimated cost of production are as follows:

- Direct material Rs. 15 per unit.
- Direct wages Rs. 9 per unit (subject to a minimum of Rs. 2,50,000 per month).
- Fixed overheads Rs. 9,60,000 per annum.

- Variable overheads Rs. 8 per unit.
- Semi-variable overheads are Rs. 5,60,000 per annum up to 50 per cent capacity and additional Rs. 1,50,000 per annum for every 25 per cent increase in capacity or a part of it.

JK Ltd. worked at 60 per cent capacity for the first three months during the year 2008, but it is expected to work at 90 per cent capacity for the remaining nine months.

The selling price per unit was Rs. 44 during the first three months.

You are required, what selling price per unit should be fixed for the remaining nine months to yield a total profit of Rs. 15,62,500 for the whole year. *(November 2008, 8 Marks)*

Answer **Statement of Cost and Sales for the year 2008**

Maximum production capacity = 5,20,000 units per annum

Particulars	First 3 months	Next 9 months	Total
Capacity utilized	60%	90%	
Production	$\frac{5,20,000 \times 3 \times 60\%}{12}$	$\frac{5,20,000 \times 9 \times 90\%}{12}$	
	= 78,000 units	= 3,51,000 units	4,29,000 units
	Rs.	Rs.	Rs.
Direct materials @ Rs. 15 per unit	11,70,000	52,65,000	64,35,000
Direct wages @ 9 per unit or Rs. 2,50,000 per month which ever is higher	7,50,000	31,59,000	39,09,000
Prime cost (A)	19,20,000	84,24,000	1,03,44,000
Overheads			
Fixed	2,40,000	7,20,000	9,60,000
Variable @ Rs. 8 per unit	6,24,000	28,08,000	34,32,000
Semi Variable	1,77,500	6,45,000	8,22,500
Total overheads (B)	10,41,500	41,73,000	52,14,500
Total Cost (C) [(A + B)]	29,61,500	1,25,97,000	1,55,58,500
Profit during first 3 months	4,70,500		
Sales @ Rs. 44 per unit	34,32,000		
Desired profit during next 9 months (Rs. 15,62,500 – Rs. 4,70,500) (D)		10,92,000	
Sales required for next 9 months (E) [(C + D)]		1,36,89,000	
Total profit			15,62,500
Total Sales			1,71,21,000

$$\text{Required selling price per unit for last 9 months} = \frac{\text{Total sales required for last 9 months}}{\text{Units produced during last 9 months}}$$

$$= \text{Rs.}\frac{1,36,89,000}{35,10,000} = \text{Rs. 39 per unit.}$$

Workings:

(1) Semi-variable overheads:

(a) For first 3 months at 60% capacity = Rs. (5,60,000 + Rs. 1,50,000) × 3/12
= Rs. 7,10,000 × 3/12
= Rs. 1,77,500.

(b) For remaining 9 months at 90% capacity = Rs. (5,60,000 + Rs. 3,00,000) × 9/12
= Rs. 8,60,000 × 9/12

Question 79

Calculate machine hour rate for recovery of overheads for a machine from the following information:

Cost of machine is Rs. 25, 00,000 and estimated salvage value is Rs. 1,00,000. Estimated working life of the machine is 10 years. Annual working hours are 3,000 in the factory. The machine is required 400 hours per annum for repairs and maintenance. Setting-up time of the machine is 156 hours per annum to be treated as productive time. Cost of repairs and maintenance for whole working life of the machine is Rs. 3,50,000. Power used 15 units per hour at a cost of Rs. 5 per unit. No power is consumed during maintenance and setting-up time. A chemical required for operating the machine is Rs. 9,880 per annum. Wages of an operator is Rs. 4,000 per month. The operator, devoted one-third of his time to the machine. Annual insurance charges 2 per cent of cost of machine.

Light charges for the department is Rs. 2,500 per month, having 48 points in all, out of which only 8 points are used at this machine. Other indirect expenses are chargeable to the machine are Rs. 6,500 per month. *(November 2008, 6 marks)*

Answer

Computation of Machine Hour Rate

Running Hours (3,000 – 400) = 2,600 per annum

Particulars	**Total Amount**	**Rate per hour**
	Rs.	Rs.
Fixed Charges (Standing Charges):		
Operator's wages: $\frac{\text{Rs. } 4,000 \times 12}{3}$	16,000	

Insurance: 2% of Rs. 25,00,000	50,000	
Light charges : $\frac{Rs.2,500\times12\times8}{48}$	5,000	
Other indirect expenses: Rs. 6,500 × 12	78,000	
Total Standing charges	1,49,000	
Hourly rate for fixed charges : $\frac{Rs.1,49,000}{2,600}$		57.31
Variable Expenses (Machine Expenses) per hour		
Depreciation : $\frac{Rs.25,00,000-Rs.1,00,000}{10\times2,600}$		92.31
Repairs and Maintenance : $\frac{Rs.3,50,000}{10\times2,600}$		13.46
Power: $\frac{Rs.5\times15\times2,444}{2,600}$		70.50
Chemical : $\frac{Rs.9,880}{2,600}$		3.80
Machine Hour Rate		237.38

5
Activity Based Costing

Question 1

Discuss the different stages in the Activity –based Costing. *(Nov., 2003, 4 marks)*

Answer

Different stages in activity –based costing

(i) Identify the different activities within the organization

(ii) Relate the overheads cost to the identified activities

(iii) Support activities are then spread across the primary activities

(iv) Determine the activity cost drivers

(v) Calculate the activity cost driver rates

(vi) Compute the overhead cost to be charged over the product by using cost driver rates.

Question 2

Give three examples of Cost Drivers of following business functions in the value chain:

(i) Research and development

(ii) Design of products, services and processes

(iii) Marketing

(iv) Distribution

(v) *Customer service* *(May, 2000, 5 marks)*

Answer

A cost driver is any factor whose change causes a change in the total cost of a related cost object. In other words, a change in the level of cost driver will cause a change in the level of the total cost of a related cost object.

The cost drivers for business functions viz. Research & Development; Design of products, services and processes; Marketing; Distribution and Customer service are as follows:

Business functions		*Cost Drivers*
(i) Research & Development	-	Number of research projects
	-	Personnel hours on a project
	-	Technical complexities of the projects
(ii) Design of products, services and processes	-	Number of products in design
	-	Number of parts per product
	-	Number of engineering hours
(iii) Marketing	-	Number of advertisement run
	-	Number of sales personnel
	-	Sales revenue
	-	Number of products and volume of sales (in quantitative terms)
(iv) Distribution	-	Number of items distributed
	-	Number of customers
	-	Weight of items distributed
(v) Customer service	-	Number of service calls
	-	Number of products serviced
	-	Hours spent in servicing of products

Question 3

MNP suits is a ready-to-wear suit manufacturer. It has four customers: two wholesale-channel customers and two retail-channel customers.

MNP suits has developed the following activity-based costing system:

Activity	*Cost driver*	*Rate in 2004*
Order processing	*Number of purchase orders*	*Rs. 1,225 per order*
Sales visits	*Number of customer visits*	*Rs. 7,150 per visit*
Delivery–regular	*Number of regular deliveries*	*Rs. 1,500 per delivery*
Delivery-rushed	*Number of rushed deliveries*	*Rs. 4,250 per delivery*

List selling price per suit is Rs. 1000 and average cost per suit is Rs. 550. The CEO of MNP suits wants to evaluate the profitability of each of the four customers in 2003 to explore opportunities for increasing profitability of his company in 2004. The following data are available for 2003:

Item	*Wholesale customers*		*Retail customers*	
	W	*H*	*R*	*T*
Total number of orders	*44*	*62*	*212*	*250*
Total number of sales visits	*8*	*12*	*22*	*20*
Regular deliveries	*41*	*48*	*166*	*190*

Rush deliveries	*3*	*14*	*46*	*60*
Average number of suits per order	*400*	*200*	*30*	*25*
Average selling price per suit	*Rs. 700*	*Rs. 800*	*Rs. 850*	*Rs. 900*

Required :

(i) Calculate the customer-level operating income in 2003.

(ii) What do you recommend to CEO of MNP suits to do to increase the company's operating income in 2004?

(iii) Assume MNP suits' distribution channel costs are Rs. 17,50,000 for its wholesale customers and Rs. 10,50,000 for the retail customers. Also, assume that its corporate sustaining costs are Rs. 12,50,000. Prepare Income statement of MNP suits for 2003.

(Nov., 2004, 6+2+2=10 marks)

Answer

(i) Customer Profitability Analysis, Customer cost hierarchy

Item	*W*	*H*	*R*	*T*
Revenue	*Rs*	*Rs*	*Rs*	*Rs*
At list price (Rs)				
44x400=17600				
62x200=12400				
212x30=6360				
250x25=6250				
17600x1000,12400x1000,6360x10006250x 1000				
	1,76,00,000	1,24,00,000	63,60,000	62,50,000
Discount				
1000-700=300				
1000-800=200				
1000-850=150				
1000-900=100				
17600x300,12400x200,				
6360x150,6250x100				
	52,80,000	24,80,000	9,54,000	6,25,000
Revenues at actual prices	1,23,20,000	99,20,000	54,06,000	56,25,000
Cost of Goods Sold				
17600x550				
12400x550				
6360x550				

6250x550				
	96,80,000	68,20,000	34,98,000	34,37,500
Gross Margin	26,40,000	31,00,000	19,08,000	21,87,500
Customer level operating Costs:				
Order processing (44,62,212,250) x (Rs1,225)	53,900	75,950	2,59,700	3,06,250
Sales visits (8,12,22,20)X(Rs 7,150)	57,200	85,800	1,57,300	1,43,000
Delivery regular (41,48,166,190) x (Rs 1,500)	61,500	72,000	2,49,000	2,85,000
Delivery rushed (3,14,46,60) (Rs 4,250)	12,750	59,500	1,95,500	2,55,000
Total customer level operating cost	1,85,350	2,93,250	8,61,500	9,89,250
Customer level operating income	24,54,650	28,06,750	10,46,500	11,98,250
Customer level operating income as %age on revenues at actual prices	19.92	28.29	19.35	21.30

(ii) Key Challenges facing CEO are –

(i) Reduce level of price discounting, especially by W

(ii) Reduce level of customer-level costs, especially by R & T

The ABC cost system highlights areas where R & T accounts are troublesome

They have

- High number of orders
- High number of customer visits
- High number of rushed deliveries

The CEO needs to consider whether this high level of activity can be reduced without reducing customer revenues.

(ii) Income Statement of MNP suits for 2003 (in Rs)

	Wholesale Customers	*Retail Customers*	*Total*
Customer level operating income	Rs 52,61,400	Rs 22,44,750	Rs 75,06,150
Less: Distribution channel cost	17,50,000	10,50,000	28,00,000
Distribution channel level operating income	35,11,400	11,94,750	47,06,150
Less: Corporate sustaining costs			12,50,000
Operating Income			34,56,150

Question 4

MST Limited has collected the following data for its two activities. It calculates activity cost rates based on cost driver capacity.

Activity	*Cost Driver*	*Capacity*	*Cost*
Power	*Kilowatt hours*	*50,000 kilowatt hours*	*Rs. 2,00,000*
Quality Inspections	*Number of Inspections*	*10,000 Inspections*	*Rs. 3,00,000*

The company makes three products M,S and T. For the year ended March 31, 2004, the following consumption of cost drivers was reported:

Product	*Kilowatt hours*	*Quality Inspections*
M	*10,000*	*3,500*
S	*20,000*	*2,500*
T	*15,000*	*3,000*

Required:

(i) Compute the costs allocated to each product from each activity.

(ii) Calculate the cost of unused capacity for each activity.

(iii) Discuss the factors the management considers in choosing a capacity level to compute the budgeted fixed overhead cost rate. (May, 2004, 6 marks)

Answer

(i) Statement of cost allocation to each product from each activity

	Product			
	M	*S*	*T*	*Total*
	Rs.	*Rs.*	*Rs.*	*Rs.*
Power *(Refer to working note)*	40,000 *(10,000 kwh x Rs.4)*	80,000 *(20,000 kwh x Rs.4)*	60,000 *(15,000 kwh x Rs.4)*	1,80,000
Quality Inspections *(Refer to working note)*	1,05,000 *(3,500 inspections x Rs. 30)*	75,000 *(2,500 inspections x Rs. 30)*	90,000 *(3,000 inspections x Rs. 30)*	2,70,000

Working note :

Rate per unit of cost driver:

Power : (Rs. 2,00,000 / 50,000 kwh) = Rs. 4/kwh

Quality Inspection : (Rs. 3,00,000 / 10,000 inspections) = Rs. 30 per inspection

(ii) Computation of cost of unused capacity for each activity:

	Rs.
Power	20,000
(Rs. 2,00,000 – Rs. 1,80,000)	
Quality Inspections	30,000
(Rs. 3,00,000 – Rs. 2,70,000)	
Total cost of unused capacity	50,000

(iii) Factors management consider in choosing a capacity level to compute the budgeted fixed overhead cost rate:

- Effect on product costing & capacity management
- Effect on pricing decisions.
- Effect on performance evaluation
- Effect on financial statements
- Regulatory requirements.
- Difficulties in forecasting chosen capacity level concepts.

Question 5

RST Limited specializes in the distribution of pharmaceutical products. It buys from the pharmaceutical companies and resells to each of the three different markets.

(i) General Supermarket Chains

(ii) Drugstore Chains

(iii) Chemist Shops

The following data for the month of April, 2004 in respect of RST Limited has been reported:

	General Supermarket Chains	*Drugstore Chains*	*Chemist Shops*
Average revenue per delivery	*Rs. 84,975*	*Rs. 28,875*	*Rs. 5,445*
Average cost of goods sold per delivery	*Rs. 82,500*	*Rs. 27,500*	*Rs.4,950*
Number of deliveries	*Rs. 330*	*Rs. 825*	*Rs. 2,750*

In the past, RST Limited has used gross margin percentage to evaluate the relative profitability of its distribution channels.

The company plans to use activity –based costing for analysing the profitability of its distribution channels.

The Activity analysis of RST Limited is as under:

Activity Area	*Cost Driver*
Customer purchase order processing	*Purchase orders by customers*
Line-item ordering	*Line-items per purchase order*
Store delivery	*Store deliveries*
Cartons dispatched to stores	*Cartons dispatched to a store per delivery*
Shelf-stocking at customer store	*Hours of shelf-stocking*

The April, 2004 operating costs (other than cost of goods sold) of RST Limited are Rs. 8,27,970. These operating costs are assigned to five activity areas. The cost in each area and the quantity of the cost allocation basis used in that area for April, 2004 are as follows:

Activity Area	*Total costs in April, 2004*	*Total Units of Cost Allocation Base used in April, 2004*
Customer purchase order processing	*Rs. 2,20,000*	*5,500 orders*
Line-item ordering	*Rs. 1,75,560*	*58,520 line items*
Store delivery	*Rs. 1,95,250*	*3,905 store deliveries*
Cartons dispatched to store	*Rs. 2,09,000*	*2,09,000 cartons*
Shelf-stocking at customer store	*Rs. 28,160*	*1,760 hours*

Other data for April, 2004 include the following:

	General Supermarket Chains	*Drugstore Chains*	*Chemist Shops*
Total number of orders	*385*	*990*	*4,125*
Average number of line items per order	*14*	*12*	*10*
Total number of store deliveries	*330*	*825*	*2,750*
Average number of cartons shipped per store delivery	*300*	*80*	*16*
Average number of hours of shelf-stocking per store delivery	*3*	*0.6*	*0.1*

Required:

(i) Compute for April, 2004 gross-margin percentage for each of its three distribution channels and compute RST Limited's operating income.

(ii) Compute the April, 2004 rate per unit of the cost-allocation base for each of the five activity areas.

(iii) Compute the operating income of each distribution channel in April, 2004 using the activity-based costing information. Comment on the results. What new insights are available with the activity-based cost information?

(iv) Describe four challenges one would face in assigning the total April,2004 operating costs of Rs. 8,27,970 to five activity areas. (May, 2004, 12 marks)

Answer

(i) RST Limited's

Statement of operating income and gross margin percentage for each of its three distribution channel

	General Super Market Chains	*Drugstore Chains*	*Chemist Shops*	*Total*
Revenues: *(Rs.)*	2,80,41,750 (330 x Rs. 84,975)	2,38,21,875 (825 x Rs. 28,875)	1,49,73,750 (2,750 x Rs. 5,445)	6,68,37,375
Less: Cost of goods sold: *(Rs.)*	2,72,25,000 (330 x Rs 82,500)	2,26,87,500 (825 x Rs 27,500)	1,36,12,500 (2,750 x Rs 4,950)	635,25,000
Gross Margin: (Rs.)	8,16,750	11,34,375	13,61,250	33,12,375
Less: Other operating costs: *(Rs)*				8,27,970
Operating income: (*Rs.)*				24,84,405
Gross Margin	2.91%	4.76 %	9.09%	4.96%
Operating income %				3.72

(ii) Computation of rate per unit of the cost allocation base for each of the five activity areas for April 2004

	Rs.
Customer purchase order processing (Rs. 2,20,000/ 5,500 orders)	40/ order
Line item ordering (Rs. 1,75,560/ 58,520 line items)	3/ line item order
Store delivery (Rs. 1,95,250/ 3,905 store deliveries)	50/ delivery
Cartons dispatched (Rs. 2,09,000/ 2,09,000 dispatches)	1/ dispatch
Shelf-stocking at customer store (Rs.) (Rs. 28,160/ 1,760 hours)	16/ hour

(iii) Operating Income Statement of each distribution channel in April-2004 (Using the Activity based Costing information)

	General Super market Chains	*Drugstore Chains*	*Chemist Shops*
Gross margin (Rs.) : (A) *(Refer to (i) part of the answer)*	8,16,750	11,34,375	13,61,260
Operating cost (Rs.) : (B) *(Refer to working note)*	1,62,910	1,90,410	4,74,650
Operating income (Rs.) : (A–B)	6,53,840	9,43,965	8,86,600
Operating income (in %) *(Operating income/ Revenue) x 100*	2.33	3.96	5.96

Comments and new insights: The activity-based cost information highlights, how the 'Chemist Shops' uses a larger amount of RST Ltd's resources per revenue than do the other two distribution channels. Ratio of operating costs to revenues, across these markets is:

General supermarket chains *(Rs. 1,62,910/ Rs. 2,80,00,750) x 100*	0.58%
Drug store chains *(Rs. 1,90,410/ Rs. 2,38,21,875) x 100*	0.80%
Chemist shops *(Rs. 4,74,650/ Rs. 1,49,73,750) x 100*	3.17%

Working note:

Computation of operating cost of each distribution channel:

	General Super market Chains Rs.	*Drugstore Chains Rs.*	*Chemist Shops Rs.*
Customer purchase order processing	15,400 *(Rs. 40 x 385 orders)*	39,600 *(Rs. 40 x 990 orders)*	1,65,000 *(Rs. 40 x 4125 orders)*
Line item ordering	16,170 *(Rs. 3 x 14 x 385)*	35,640 *(Rs. 3 x 12 x 990)*	1,23,750 *(Rs. 3 x 10 x 4125)*
Store delivery	16,500 *(Rs. 50 x 330 deliveries)*	41,250 *(Rs. 50 x 825 deliveries)*	1,37,500 *(Rs. 50 x 2750 deliveries)*
Cartons dispatched	99,000 *(Re. 1 x 300 cartons x 300 deliveries)*	66,000 *(Re. 1 x 80 cartons x 825 deliveries)*	44,000 *(Re. 1 x 16 cartons x 2,750 deliveries)*

Shelf stocking	15,840 *(Rs. 16 x 330 deliveries x 3 Av. hrs.)*	7,920 *(Rs. 16 x 825 deliveries x 0.6 Av. hrs)*	4,400 *(Rs. 16 x 2,750 deliveries x 0.1 Av. hrs)*
Operating cost	1,62,910	1,90,410	4,74,650

(iv) Challenges faced in assigning total operating cost of Rs. 8,27,970 :

- Choosing an appropriate cost driver for activity area.
- Developing a reliable data base for the chosen cost driver.
- Deciding, how to handle costs that may be common across several activities.
- Choice of the time period to compute cost rates per cost driver.
- Behavioural factors.

Question 6

Alpha Limited has decided to analyse the profitability of its five new customers. It buys bottled water at Rs. 90 per case and sells to retail customers at a list price of Rs. 108 per case. The data pertaining to five customers are:

	Customers				
	A	*B*	*C*	*D*	*E*
Cases sold	*4,680*	*19,688*	*1,36,800*	*71,550*	*8,775*
List Selling Price	*Rs. 108*	*Rs. 108*	*Rs. 108*	*Rs. 108*	*Rs. 108*
Actual Selling Price	*Rs. 108*	*Rs. 106.20*	*Rs. 99*	*Rs. 104.40*	*Rs. 97.20*
Number of Purchase orders	*15*	*25*	*30*	*25*	*30*
Number of Customer visits	*2*	*3*	*6*	*2*	*3*
Number of deliveries	*10*	*30*	*60*	*40*	*20*
Kilometers travelled per delivery	*20*	*6*	*5*	*10*	*30*
Number of expedited deliveries	*0*	*0*	*0*	*0*	*1*

Its five activities and their cost drivers are:

Activity	*Cost Driver Rate*
Order taking	*Rs. 750 per purchase order*
Customer visits	*Rs. 600 per customer visit*
Deliveries	*Rs. 5.75 per delivery Km traveled*
Product handling	*Rs. 3.75 per case sold*
Expedited deliveries	*Rs. 2,250 per expedited delivery*

Required:

(i) *Compute the customer-level operating income of each of five retail customers now being examined (A, B, C, D and E). Comment on the results.*

(ii) *What insights are gained by reporting both the list selling price and the actual selling price for each customer?*

(iii) *What factors Alpha Limited should consider in deciding whether to drop one or more of five customers? (Nov., 2003, 7+3+2= 12 marks)*

Answer

Working note:

Computation of revenues (at listed price), discount, cost of goods sold and customer level operating activities costs:

	Customers				
	A	*B*	*C*	*D*	*E*
Cases sold: (a)	4,680	19,688	1,36,800	71,550	8,775
Revenues (at listed price) (Rs.): (b) *{(a) x Rs. 108)}*	5,05,440	21,26,304	1,47,74,400	77,27,400	9,47,700
Discount (Rs.): (c) *{(a) x Discount per case}*	-	35,438 (19,688 cases x Rs. 1.80)	12,31,200 (1,36,800 cases x Rs. 9)	2,57,580 (71,550 cases x Rs. 3.60)	94,770 (8,775 cases x Rs. 10.80)
Cost of goods sold (Rs.) : (d) *{(a) x Rs. 90}*	4,21,200	17,71,920	1,23,12,000	64,39,500	7,89,750
Customer level operating activities costs					
Order taking costs (Rs.): *(No. of purchase orders x Rs. 750)*	11,250	18,750	22,500	18,750	22,500
Customer visits costs (Rs.) *(No. of customer visits x Rs. 600)*	1,200	1,800	3,600	1,200	1,800

Delivery vehicles travel costs (Rs.) *(Rs. 5.75 per km)* *(Kms traveled by delivery vehicles x Rs. 5.75 per km.)*	1,150	1,035	1,725	2,300	3,450
Product handling costs (Rs.) *{(a) x Rs. 3.75}*	17,550	73,830	5,13,000	2,68,313	32,906
Cost of expediting deliveries (Rs.) *{No. of expedited deliveries x Rs. 2,250}*	-	-	-	-	2,250
Total cost of customer level operating activities (Rs.)	31,150	95,415	5,40,825	2,90,563	62,906

(i) Computation of Customer level operating income

	Customers				
	A	*B*	*C*	*D*	*E*
	Rs.	*Rs.*	*Rs.*	*Rs.*	*Rs.*
Revenues *(At list price)* *(Refer to working note)*	5,05,440	21,26,304	1,47,74,400	77,27,400	9,47,700
Less: Discount *(Refer to working note)*	-	35,438	12,31,200	2,57,580	94,770
Revenue *(At actual price)*	**5,05,440**	**20,90,866**	**1,35,43,200**	**74,69,820**	**8,52,930**
Less: Cost of goods sold *(Refer to working note)*	4,21,200	17,71,920	1,23,12,000	64,39,500	7,89,750
Gross margin	84,240	3,18,946	12,31,200	10,30,320	63,180
Less: Customer level operating activities costs *(Refer to working note)*	31,150	95,415	5,40,825	2,90,563	62,906
Customer level operating income	53,090	2,23,531	6,90,375	7,39,757	274

Comment on the results:

Customer D is the most profitable customer, despite having only 52.30% of the unit volume of customer C. The main reason is that C receives a Rs. 9 per case discount while customer D receives only a Rs. 3.60 discount per case.

Customer E is less profitable, in comparison with the small customer A being profitable. Customer E received a discount of Rs. 10.80 per case, makes more frequent orders, requires more customer visits and requires more delivery kms. in comparison with customer A.

(ii) Insight gained by reporting both the list selling price and the actual selling price for each customer:

Separate reporting of both-the listed and actual selling prices enables Alpha Ltd. to examine which customer has received what discount per case, whether the discount received has any relationship with the sales volume. The data given below provides us with the following information;

Sales volume	*Discount per case (Rs.)*
C (1,36,800 cases)	9.00
D (71,550 cases)	3.60
B (19,688 cases)	1.80
E (8,775 cases)	10.80
A (4,680 cases)	0

The above data clearly shows that the discount given to customers per case has a direct relationship with sales volume, except in the case of customer E. The reasons for Rs. 10.80 discount per case for customer E should be explored.

(iii) Factors to be considered for dropping one or more customers:

Dropping customers should be the last resort to be taken by Alpha Ltd. Factors to be considered should include:

What is the expected future profitability of each customer? Are the currently least profitable (E) or low profitable (A) customers are likely to be highly profitable in the future?

What costs are avoidable if one or more customers are dropped?

Can the relationship with the "problem" customers be restructured so that there is at "win win" situation?

Question 7

Family Store wants information about the profitability of individual product lines: Soft drinks, Fresh produce and Packaged food. Family store provides the following data for the year 2002-03 for each product line:

	Soft drinks	*Fresh produce*	*Packaged food*
Revenues	*Rs. 7,93,500*	*Rs. 21,00,600*	*Rs. 12,09,900*
Cost of goods sold	*Rs. 6,00,000*	*Rs. 15,00,000*	*Rs. 9,00,000*
Cost of bottles returned	*Rs. 12,000*	*Rs. 0*	*Rs. 0*
Number of purchase orders placed	*360*	*840*	*360*
Number of deliveries received	*300*	*2,190*	*660*
Hours of shelf-stocking time	*540*	*5,400*	*2,700*
Items sold	*1,26,000*	*11,04,000*	*3,06,000*

Family store also provides the following information for the year 2002-03:

Activity	*Description of Activity*	*Total cost*	*Cost-allocation Base*
Bottles returns	*Returning of empty bottles*	*Rs. 12,000*	*Direct tracing to soft drink line*
Ordering	*Placing of orders for purchases*	*Rs. 1,56,000*	*1,560 purchase orders*
Delivery	*Physical delivery and receipt of goods*	*Rs. 2,52,000*	*3,150 deliveries*
Shelf stocking	*Stocking of goods on store shelves and on-going restocking*	*Rs. 1,72,800*	*8,640 hours of shelf-stocking time*
Customer Support	*Assistance provided to customers including check-out*	*Rs. 3,07,200*	*15,36,000 items sold*

Required:

(i) Family store currently allocates support cost (all cost other than cost of goods sold) to product lines on the basis of cost of goods sold of each product line. Calculate the operating income and operating income as a % of revenues for each product line.

(ii) If Family Store allocates support costs (all costs other than cost of goods sold) to product lines using and activity based costing system, calculate the operating income and operating income as a% of revenues for each product line.

(iii) Comment on your answers in requirements (i) and (ii).

(May, 2003, 3+7+2=12 marks)

Answer

(i) Statement of Operating income and Operating income as a percentage of revenues for each product line

(When support costs are allocated to product lines on the basis of cost of goods sold of each product)

	Soft Drinks Rs.	*Fresh Produce Rs.*	*Packaged Foods Rs.*	*Total Rs.*
Revenues: (A)	7,93,500	21,00,600	12,09,900	41,04,000
Cost of Goods sold (COGS): (B)	6,00,000	15,00,000	9,00,000	30,00,000
Support cost (30% of COGS): (C)	1,80,000	4,50,000	2,70,000	9,00,000
Total cost: (D) = {(B) + (C)}	7,80,000	19,50,000	11,70,000	39,00,000
Operating income: E= {(A)-(D)}	13,500	1,50,600	39,900	2,04,000
Operating income as a percentage of revenues: (E/A) x 100)	1.70%	7.17%	3.30%	4.97%

Working notes:

1. **Total support cost:**

	Rs.
Bottles returns	12,000
Ordering	1,56,000
Delivery	2,52,000
Shelf stocking	1,72,800
Customer support	3,07,200
Total support cost	9,00,000

2. **Percentage of support cost to cost of goods sold (COGS):**

$$= \frac{\text{Total support cost}}{\text{Total cost of goods sold}} \times 100$$

$$= \frac{\text{Rs.9,00,000}}{\text{Rs.30,00,000}} \times 100 = 30\%$$

3. **Cost for each activity cost driver:**

Activity (1)	*Total cost Rs.* (2)	*Cost allocation base* (3)	*Cost driver rate* (4)=[(2)÷(3)]
Ordering	1,56,000	1,560 purchase orders	100 per purchase order
Delivery	2,52,000	3,150 deliveries	80 per delivery
Shelf-stocking	1,72,800	8,640 hours	20 per stocking hour
Customer support	3,07,200	15,36,000 items sold	0.20 per item sold

(ii) Statement of Operating income and Operating income as a percentage of revenues for each product line

(When support costs are allocated to product lines using an activity-based costing system)

	Soft drinks Rs.	*Fresh Produce* Rs.	*Packaged Food* Rs.	*Total* Rs.
Revenues: (A)	7,93,500	21,00,600	12,09,900	41,04,000
Cost & Goods sold	6,00,000	15,00,000	9,00,000	30,00,000
Bottle return costs	12,000	0	0	12,000
Ordering cost* (360:840:360)	36,000	84,000	36,000	1,56,000
Delivery cost* (300:2,190:660)	24,000	1,75,200	52,800	2,52,000
Shelf stocking cost* (540:5,400:2,700)	10,800	1,08,000	54,000	1,72,800
Customer Support cost* (1,26,000:11,04,000:3,06,000)	25,200	2,20,800	61,200	3,07,200
Total cost: (B)	7,08,000	20,88,000	11,04,000	39,00,000
Operating income C:{(A)- (B)}	85,500	12,600	1,05,900	2,04,000
Operating income as a % of revenues	10.78%	0.60%	8.75%	4.97%

** Refer to working note 3*

(iii) Comment: Managers believe that activity based costing (ABC) system is more credible than the traditional costing system. The ABC system distinguishes with different type of activities at family store more precisely. It also tracks more precisely how individual product lines use resources.

Soft drinks consume less resources than either fresh produce or packaged food. Soft drinks have fewer deliveries and require less shelf stocking time.

Family store managers can use ABC information to guide their decisions, such as how to allocate a planned increase in floor space.

Pricing decision can also be made in a more informed way with ABC information.

Question 8

A B C D Co. Ltd. produces and sells four products A, B, C and D. These products are similar and usually produced in production runs of 10 units and sold in a batch of 5 units. The production details of these products are as follows:

Product	*A*	*B*	*C*	*D*
Production (Units)	*100*	*110*	*120*	*150*
Cost per unit:				
Direct material (Rs.)	*30*	*40*	*35*	*45*
Direct labour (Rs.)	*25*	*30*	*30*	*40*
Machine hour (per unit)	*5*	*4*	*3*	*4*

The production overheads during the period are as follows:

	Rs.	
Factory works expenses	*22,500*	
Stores receiving costs	*8,100*	
Machine set up costs	*12,200*	
Cost relating to quality control	*4,600*	
Material handling and dispatch	*9,600*	*Rs. 57,000*

The cost drivers for these overheads are detailed below:

Cost	*Cost drivers*
Factory works expenses	*Machine hours*
Stores receiving costs	*Requisitions raised*
Machine set up costs	*No. of production runs*
Cost relating to quality control	*No. of production runs*
Material handling and dispatch	*No. of orders executed*

The number of requisitions raised on the stores was 25 for each product and number of orders executed was 96, each order was in a batch of 05 units.

Required:

(i) *Total cost of each product assuming the absorption of overhead on machine hour basis;*

(ii) *Total cost of each product assuming the absorption of overhead by using activity base costing; and*

(iii) *Show the differences between (i) and (ii) and comment.* *(4+4+4=12 marks)*

Answer

(i) Statement showing total cost of each product assuming absorption of overheads on Machine Hour Rate Basis.

Particulars	A	B	C	D	Total
Output (units)	100	110	120	150	480
Direct material (Rs.)	30	40	35	45	150
Direct Labour (Rs.)	25	30	30	40	125
Direct labour- Machine hrs	5	4	3	4	
Overhead @ Rs 30/- per Machine hr	150	120	90	120	480
Total cost per unit (Rs.)	205	190	155	205	755
Total cost (Rs.)	20,500	20,900	18,600	30,750	90,750

$$\text{Overhead Rate} = \frac{\text{Total Overhead Cost}}{\text{Total MHrs.}} = \frac{\text{Rs. 57,000}}{\text{1,900}} = \text{Rs. 30 per unit}$$

(ii)

Total Overheads	Rs		
Factory works expenses	22,500	Factory exp per unit	22,500 / 1,900= Rs. 11.84
Stores receiving cost	8,100	Stores receiving cost	8100 / 100 = Rs. 81
Machine set up costs	12,200	Machine set-up cost	12,200 / 48 = Rs. 254.1
Costs relating to quality control	4,600	Cost relating to QC	4,600/48 =Rs 95.83
Expense relating to material handling & dispatch	9,600	Material handling & dispatch	9,600 / 96 = Rs. 100/-
Total	57,000		

Statement showing total cost of each product assuming activity based costing.

Particulars	*A*	*B*	*C*	*D*	*Total*
Output (Units)	100	110	120	150	480
No. of production runs	10	11	12	15	48
No. of stores requisition	25	25	25	25	100
No. of sales orders	20	22	24	30	96
Unit costs - Direct material (Rs.)	30.00	40.00	35.00	45.00	
Unit costs - Direct labour (Rs.)	25.00	30.00	30.00	40.00	
Unit costs - Factory works expenses (Rs.)	59.20	47.36	35.52	47.36	
Unit costs - Stores receiving cost (Rs.)	20.25	18.41	16.88	13.50	
Unit costs - Machine set-up cost (Rs.)	25.42	25.42	25.42	25.42	
Unit costs – QC (Rs.)	9.58	9.58	9.58	9.58	
Unit costs – Material Handling (Rs.)	20.00	20.00	20.00	20.00	
Unit cost (Rs.)	189.45	190.77	172.40	200.86	
Total cost (Rs)	18,945	20,984.7	20,688.00	30,129	

(iii) Statement showing differences (in Rs)

Particulars	*A*	*B*	*C*	*D*
Unit cost MHR	205	190	155	205
Unit cost ABC	189.45	190.77	172.40	200.86
Unit cost - difference	15.55	-0.77	-17.40	4.14
Total cost MHR	20,500	20,900	18,600	30,750
Total cost ABC	18,945	20,985	20,688	30,128

The difference is that A consumes comparatively more of Machine hours.

The use of activity based costing gives different product costs than what were arrived at by utilising traditional costing. It can be argued that Product costs using ABC are more precise as overheads have been identified with specific activities.

Question 9

ABC Limited manufactures two radio models, the Nova which has been produced for five years and sells for Rs. 900, and the Royal, a new model introduced in early 2004, which sells for Rs. 1,140. Based on the following Income statement for the year 2004-05, a decision has been made to concentrate ABC Limited's marketing resources on the Royal model and to begin to phase out the Nova model.

ABC Limited

Income Statement for the year ending March 31, 2005

	Royal Model	Nova Model	Total
	Rs.	Rs.	Rs.
Sales	45,60,000	1,98,00,000	2,43,60,000
Cost of Goods sold	31,92,000	1,25,40,000	1,57,32,000
Gross margin	13,68,000	72,60,000	86,28,000
Selling & Administrative Expenses	9,78,000	58,30,000	68,08,000
Net Income	3,90,000	14,30,000	18,20,000
Unit Produced and sold	4,000	22,000	
Net Income per unit sold	97.50	65	

The standard unit costs for the Royal and Nova models are as follows:

	Royal Model	Nova Model
	Rs.	Rs.
Direct materials	584	208
Direct Labour		
Royal (3.5 hrs x Rs. 12)	42	
Nova (1.5 hrs x Rs. 12)		18
Machine usage		
Royal (4 hrs x Rs. 18)	72	
Nova (8 hrs x Rs. 18)		144
Manufacturing overheads (applied on the basis of machine hours at a pre-determined rate of Rs. 25 per hour)	100	200
Standard Cost	798	570

ABC Ltd.'s Controller is advocating the use of activity-based costing and activity-based cost management and has gathered the following information about the company's manufacturing overheads cost for the year ending March 31, 2005.

Activity centre (Cost driver)	Traceable Costs Rs.	Number of Events		
		Royal	Nova	Total
Soldering (Number of solder joints)	9,42,000	3,85,000	11,85,000	15,70,000

Shipments (Number of shipments)	*8,60,000*	*3,800*	*16,200*	*20,000*
Quality control (Number of Shipments)	*12,40,000*	*21,300*	*56,200*	*77,500*
Purchase orders (Number of orders)	*9,50,400*	*1,09,980*	*80,100*	*1,90,080*
Machine Power (Machine hours)	*57,600*	*16,000*	*1,76,000*	*1,92,000*
Machine setups (Number of setups)	*7,50,000*	*14,000*	*16,000*	*30,000*
Total Traceable costs	*48,00,000*			

Required:

(i) Prepare a Statement showing allocation of manufacturing overheads using the principles of activity-based costing.

(ii) Prepare a Statement showing product cost profitability using activity-based costing.

(iii) Should ABC Ltd. continue to emphasize the Royal model and phase out the Nova model ? Discuss. *(4+4+2 = 10 marks)*

Answer

(a) (i) Statement Showing Allocation of Manufacturing Overheads Using Principles of Activity Based Costing.

Activity Center	Traceable cost Rs.	Cost allocation basis	Cost Allocation	
			Royal Rs.	Nova Rs.
Soldering	9,42,000	385:1185	2,31,000	7,11,000
Shipments	8,60,000	38:162	1,63,400	6,96,600
Quality control	12,40,000	213:562	3,40,800	8,99,200
Purchase orders	9,50,400	109980:80100	5,49,900	4,00,500
Machine lower	57,600	16:176	4,800	52,800
Machine set ups	7,50,000	14:16	3,50,000	4,00,000
	48,00,000		16,39,900	31,60,100

Units produced and sold	4,000	22,000
Manufacturing Overheads Cost per unit	Rs. 409.98	Rs. 143.64

(ii) Statement Showing Product Cost and Profitability using Activity Based Costing

	Royal Per Unit Cost Rs.	Nova Per Unit Cost Rs.	Total Rs.
Standard cost other than manufacturing OHs cost	698	370	
Manufacturing OHs using activity-based costing	409.98	143.64	
Cost	1,107.98	513.64	
Selling Price/unit	1,140	900	
Gross Margin / unit	32.02	386.36	
Gross Margin	1,28,080	84,99,920	86,28,000
Selling & Adm. Expenses	9,78,000	58,30,000	68,08,000
Net Income	**(8,49,920)**	**26,69,920**	**18,20,000**

(iii) Novo Model should continue to be bread and butter product and Royal model should not be over-emphasized; rather it's pricing is required to be corrected.

Question 10

ABC Bank is examining the profitability of its Premier Account, a combined Savings and Cheque account. Depositors receive a 7% annual interest on their average deposit. ABC Bank earns an interest rate spread of 3% (the difference between the rate at which it lends money and rate it pays to depositors) by lending money for home loan purpose at 10%.

The Premier Account allows depositors unlimited use of services such as deposits, withdrawals, cheque facility, and foreign currency drafts. Depositors with Premier Account balances of Rs. 50,000 or more receive unlimited free use of services. Depositors with minimum balance of less than Rs. 50,000 pay Rs. 1,000-a-month service fee for their Premier Account.

ABC Bank recently conducted an activity-based costing study of its services. The use of these services in 2005-06 by three customers is as follows:

	Activity-Based Cost Per Transaction	*Account Usage*		
		Customer X	*Customer Y*	*Customer Z*
Deposits/withdrawal with teller	Rs. 125	*40*	*50*	*5*
Deposits/withdrawal with automatic teller machine (ATM)	*Rs. 40*	*10*	*20*	*16*
Deposits/withdrawal on pre-arranged monthly basis	*Rs. 25*	*0*	*12*	*60*
Bank Cheques written	*Rs. 400*	*9*	*3*	*2*
Foreign Currency drafts	*Rs. 600*	*4*	*1*	*6*
Inquiries about Account balance	*Rs. 75*	*10*	*18*	*9*
Average Premier Account balance for 2005-06		*Rs. 55,000*	*Rs. 40,000*	*Rs. 12,50,000*

Assume Customer X and Z always maintains a balance above Rs. 50,000, whereas Customer Y always has a balance below Rs. 50,000.

Required:

(i) Compute the 2005-06 profitability of the customers X, Y and Z Premier Account at ABC Bank.

(ii) What evidence is there of cross-subsidisation among the three Premier Accounts? Why might ABC Bank worry about this Cross-subsidisation, if the Premier Account product offering is Profitable as a whole?

(iii) What changes would you recommend for ABC Bank's Premier Account?

Answer

(i) Customer Profitability Analysis

ABC Bank – Premier Account

Activity	Activity based cost	Customers		
		X	Y	Z
	Rs.	Rs.	Rs.	Rs.
Deposits/withdrawal with teller	125	5,000 *(40 × 125)*	6,250 *(40 × 125)*	625 *(5 × 125)*
Deposits/withdrawal with ATM	40	400 *(10 × 40)*	800 *(20 × 40)*	640 *(16 × 40)*
Deposits/withdrawal on prearranged monthly basis	25	0 *(0 × 25)*	300 *(12 × 25)*	1,500 *(60 × 25)*
Bank cheques written	400	3,600 *(9 × 400)*	1,200 *(3 × 400)*	800 *(2 × 400)*
Foreign currency drafts	600	2,400 *(4 × 600)*	600 *(1 × 600)*	3,600 *(6 × 600)*
Inquiries about Account balance	75	750 *(10 × 75)*	1,350 *(18 × 75)*	675 (9 × 75)
Customer cost (A)		**12,150**	**10,500**	**7,840**
Spread on Average balance maintained	3%	1,650 *(3% × 55,000)*	1,200 (3% × 40,000)	37,500 *(3% × 12,50,000)*
Service fee	Rs. 1,000 p.m.		12,000	
Customer benefit		**1,650**	**13,200**	**37,500**

	Customers		
	X	Y	Z
Customer Profitability (Benefits – Costs)	Rs. (10,500)	Rs. 2,700	Rs. 29,660

(ii) Customer Z is most profitable and is cross-subsidising the most demanding customer X. Customer Y is paying for the services used, because of not being able to maintain minimum balance. No doubt, 'Premier Account' product offering is profitable as a whole, but the worry is of not finding customers like customer Z who will maintain a balance higher than the stipulated minimum. It appears, the minimum balance stipulated is inadequate considering the services availed by depositors in 'Premium Account'.

(iii) The changes suggested to ABC Bank's 'Premier Account' are as follows:

- Increase the requirement of minimum balance from Rs. 50,000 to Rs. 1,00,000.
- Charge for value added services like Foreign Currency Drafts.
- Do not allow deposits/withdrawal below Rs. 10,000 at the teller. Only ATM machine withdrawal be allowed.
- Inquiries about account balance to be entertained only through Phone Banking/ATM.

Question 12

ABC Ltd. Manufactures two types of machinery equipments Y and Z and applies/absorbs overheads on the basis of direct-labour hours. The budgeted overheads and direct-labour hours for the month of December, 2006 are Rs. 12,42,500 and 20,000 hours respectively. The information about Company's products is as follows:

	Equipment Y	*Equipment Z*
Budgeted Production volume	*2,500 units*	*3,125 units*
Direct material cost	*Rs. 300 per unit*	*Rs. 450 per unit*
Direct labour cost		
Y : 3 hours @ Rs. 150 per hour		
X : 4 hours @ Rs. 150 per hour	*Rs. 450*	*Rs. 600*

ABC Ltd.'s overheads of Rs. 12,42,500 can be identified with three major activities:

Order Processing (Rs. 2,10,000), machine processing (Rs. 8,75,000), and product inspection (Rs. 1,57,500). These activities are driven by number of orders processed, machine hours worked, and inspection hours, respectively. The data relevant to these activities is as follows:

	Orders processed	*Machine hours worked*	*Inspection hours*
Y	*350*	*23,000*	*4,000*
Z	*250*	*27,000*	*11,000*
Total	*600*	*50,000*	*15,000*

Required:

(i) Assuming use of direct-labour hours to absorb/apply overheads to production, compute the unit manufacturing cost of the equipments Y and Z, if the budgeted manufacturing volume is attained.

(ii) Assuming use of activity-based costing, compute the unit manufacturing costs of the equipments Y and Z, if the budgeted manufacturing volume is achieved.

(iii) ABC Ltd.'s selling prices are based heavily on cost. By using direct-labour hours as an application base, calculate the amount of cost distortion (under-costed or over-costed) for each equipment.

(iv) Discuss, how an activity-based costing might benefit ABC Ltd.

Answer

(i) Overheads application base: Direct labour hours

	Equipment Y	***Equipment Z***
	Rs.	*Rs.*
Direct material cost	300	450
Direct labour cost	450	600
Overheads*	186.38	248.50
	936.38	1,298.50

$$\text{*Pre-determined rate} = \frac{\text{Budgeted overheads}}{\text{Budgeted direct labour hours}}$$

$$= \frac{\text{Rs. } 12,42,500}{20,000 \text{ hours}} = \text{Rs. } 62.125$$

(ii) Estimation of Cost-Driver rate

Activity	*Overhead cost*	*Cost-driver level*	*Cost driver rate*
	Rs.		*Rs.*
Order processing	2,10,000	600 Orders processed	350
Machine processing	8,75,000	50,000 Machine hours	17.50
Inspection	1,57,500	15,000 Inspection hours	10.50

	Equipment Y	***Equipment Z***
	Rs.	*Rs.*
Direct material cost	300	450
Direct labour cost	450	600
Prime cost	750	1,050
Overhead cost		
Order processing 350 : 250	1,22,500	87,500
Machine processing 23,000 : 27,000	4,02,500	4,72,500
Inspection 4,000 : 11,000	42,000	1,15,500
Total overhead cost	5,67,000	6,75,500
Per unit cost		
= 5,67,000/2,500	226.80	Rs. 216.16
= 6,75,500/3,125		
Unit manufacturing cost	Rs. 976.80	Rs. 1,266.16

(iii)

	Equipment Y	***Equipment Z***
	Rs.	*Rs.*
Unit manufacturing cost–using direct labour hours as an application base	936.38	Rs. 1,298.50

Unit manufacturing cost–using activity based costing	976.80	Rs. 1,266.16
Cost distortion	(–)40.42	(+)32.34

Low volume product Y is under-costed and high volume product Z is over-costed using direct labour hours as a basis for overheads absorption. It is due to the limitation of traditional costing system.

(iv) Activity-based costing system is suitable in case of ABC Ltd because it is a multi-product company and overheads costs are substantial portion of total cost. The use of activity based costing will avoid cost distortion as ABC Ltd has a large proportion of non-unit-level activities such as orders processed and inspection hours.

Question 13

Explain briefly each of the following categories in Activity based Costing by giving at least two examples:

(i) Unit level activities

(ii) Batch level activities

(iii) Product level activities

(iv) Facility level activities. *(May 2007, 8 Marks)*

Answer

(i) Unit level activities – The cost of some activities (mainly primary activities) are strongly co-related to the number of units produced. These activities are known as unit level activities. Examples are:

(a) The use of indirect materials.

(b) Inspection or testing of every item produced or say every 100th item produced.

(c) Indirect consumables.

(ii) Batch level activities – The cost of some activities (mainly manufacturing support activities) are driven by the number of batches of units produced. These activities are known as Batch level activities. Examples are:

(a) Material ordering.

(b) Machine set up cost.

(c) Inspection of products - like first item of every batch.

(iii) Product level activities – The cost of some activities are driven by the creation of a new product line and its maintenance. These activities are known as Product level activities. Examples are:

(a) Designing the product.

(b) Producing parts to a certain specified limit.

(c) Advertising cost, if advertisement is for individual products.

(iv) Facility level activities – The cost of some activities cannot be related to a particular product line, instead they are related to maintaining the building and facilities. These activities are known as Facility level activities. Examples are:

(a) Maintenance of buildings.

(b) Plant security.

(c) Production manager's salary.

(d) Advertising campaigns promoting the company.

Question 14

PQR Ltd. manufactures four products, namely A, B, C and D using the same plant and process. The following information relates to production period October, 2007:

Product	*A*	*B*	*C*	*D*
Output in units	*1440*	*1200*	*960*	*1008*
Cost per unit:				
Direct Materials	*Rs. 42*	*Rs. 45*	*Rs. 40*	*Rs. 48*
Direct Labour	*Rs. 10*	*Rs. 9*	*Rs. 7*	*Rs. 8*
Machine hours per unit	*4*	*3*	*2*	*1*

The four products are similar and are usually produced in production runs of 48 units per batch and are sold in batches of 24 units. Currently, the production overheads are absorbed using machine hour rate. The production overheads incurred by the company for the period October, 2007 are as follows:

	Rs.
Machine department costs (rent, deprecation and supervision)	*1,26,000*
Set-up Costs	*40,000*
Store receiving costs	*30,000*

Inspection	*20,000*
Material handling and dispatch	*5,184*

During the period October, 2007, the following cost drivers are to be used for allocation of overheads cost:

Cost	*Cost driver*
Set-up Costs	*Number of production runs (batches)*
Stores receiving	*Requisition raised*
Inspection	*Number of production runs (batches)*
Material handling and dispatch	*Orders executed*

It is also determined that:

(i) Machine department costs should be apportioned among set-up, stores receiving and inspection activities in proportion of 4 : 3 : 2.

(ii) The number of requisitions raised on stores are 50 for each product. The total number of material handling and dispatch orders executed during the period are 192 and each order being for a batch size of 24 units of product.

Required:

(i) Calculate the total cost of each product, if all overhead costs are absorbed on machine-hour rate basis.

(ii) Calculate the total cost of each product using activity-based costing.

(iii) Comment briefly on as to how an activity-based costing might benefit PQR Ltd.

(November 2007, 11 Marks)

Answer 14

(i) Total Overhead = Rs. 1,26,000 + 40,000 + 30,000 + 20,000 + 5,184 = Rs. 2,21,184

Total machine hours = $1,440 \times 4 + 1,200 \times 3 + 960 \times 2 + 1,008 \times 1$

$= 5,760 + 3,600 + 1,920 + 1,008 = 12,288.$

$\therefore$ Overhead recovery rate / M.H. = $\frac{2,21,184}{12,288}$ = Rs. 18

Cost Statement when overheads are absorbed on machine hours rate basis

(Traditional Costing)

Product	*A*	*B*	*C*	*D*
Output in units	1,440	1,200	960	1,008
Cost per unit:				

Direct material Rs.	42	45	40	48
Direct labour Rs.	10	9	7	8
Overhead (@ Rs.18) Rs.	4× 18 = 72	3 × 18 = 54	2× 18 = 36	1× 18 = 18
Total cost per unit Rs. (Material + Laour + overhead	124	108	83	74
Total cost Rs. (Output in units × Total cost per unit)	1,78,560	1,29,600	79,680	74,592

(ii) (1) Machine department costs of Rs. 1,26,000 to be apportioned to set-up cost, store receiving and inspection in 4 : 3 : 2 i.e. Rs. 56,000, Rs. 42,000 and Rs. 28,000 respectively.

(2) One production run = 48 units. Hence, the number of production runs of different products:

$$A = \frac{1,440}{48} = 30,\ B = \frac{1,200}{48} = 25,\ C = \frac{960}{48} = 20,\ D = \frac{1,008}{48} = 21$$ or total 96 runs.

(3) One batch order is of 24 units. So the number of batches of different products:

$$A = \frac{1,440}{24} = 60,\ B = \frac{1,200}{24} = 50,\ C = \frac{960}{24} = 40,\ D = \frac{1,008}{24} = 42$$ or total 192 batches.

(4) **Computation of Cost driver rates**

Activity	*Activity Cost (Rs.)*	Cost driver	*Quantity*	*Cost driver rate*
Set-up	40,000 + 56,000 = 96,000	No. of production run	96	Rs. 1,000 per production run
Store-receiving	30,000 + 42,000 = 72,000	Requisition raised	50 × 4 = 200	Rs. 360 per requisition
Inspection	20,000 + 28,000 = 48,000	No. of production run	96	Rs. 500 per production run
Material handling	5,184	Orders executed (No. of batches)	192	Rs. 27 per batch

(5) Cost statement under Activity Based Costing:

Product	*A*	*B*	*C*	*D*
Out-put in units	1,440	1,200	960	1,008
	Rs.	*Rs.*	*Rs.*	*Rs.*
Material	1,440 × 42 = 60,480	1,200 × 45 = 54,000	960 × 40 = 38,400	1,008 × 48 = 48,384
Labour	1,440 × 10 = 14,400	1,200 × 9 = 10,800	960 × 7 = 6,720	1,008 × 8 = 8,064
Overhead cost:				
Set up	1,000 × 30 = 30,000	1,000 × 25 = 25,000	1,000 × 20 = 20,000	1,000 × 21 = 21,000
Store receiving	360 × 50 = 18,000	360 × 50 = 18,000	360 × 50 = 18,000	360 × 50 = 18,000
Inspection	500 × 30 = 15,000	500 × 25 = 12,500	500 × 20 = 10,000	500 × 21 = 10,500
Material handling	27 × 60 = 1,620	27 × 50 = 1,350	27 × 40 = 1,080	27 × 42 = 1,134
Total overhead cost	64,620	56,850	49,080	50,634
Total cost	1,39,500	1,21,650	94,200	1,07,082
Total cost per unit, (Total cost / Output)	96.875	101.375	98.125	106.232

(iii) Comparison of Overhead cost differences

Overhead cost per unit under Traditional Absorption Costing system	(Rs. 18 × 4 machine hours) 72.00	(Rs. 18 × 3 machine hours) 54.00	(Rs. 18 × 2 machine hours) 36.00	(Rs. 18 × 1 machine hour) 18.00
Overhead cost under Activity Based Costing system	$\frac{64,620}{1,440} = 44.875$	$\frac{56,850}{1,200} = 47.375$	$\frac{49,080}{960} = 51.125$	$\frac{50,634}{1,008} = 50.2$

Overhead Cost difference	27.125	6.625	(15.125)	(32.232)
Overhead difference due to absorption system	–37.68% over cost	–12.27% over cost	+42.10% under cost	+179.07% under cost

Comments:

(i) There is a wide difference between the overhead cost as traced by the two systems. ABC is a superior method of tracing overhead costs since it relates the overhead costs with activities and resources consumed rather than just the machine hours rate.

(ii) Products A and B have been over costed under absorption costing since machine hours per unit are higher than that of products C and D.

Question 15

XYZ Ltd. produces and sells sophisticated glass items – 'A' and 'B'. In connection with both the products the following informations are revealed from the cost records for the month February, 2008:

Product	*A*	*B*
Output (in units)	*60,000*	*15,000*
Sales (Rs.)	*37,80,000*	*20,55,000*
Cost structure:		
Direct material (Rs. per unit)	*18.75*	*45.00*
Direct Wages (Rs. per unit)	*10.00*	*13.00*
Direct labour hours	*30,000 hours*	*9,750 hours*
No. of quantity produced per batch	*240*	*50*
Setup time per batch	*2 hours*	*5 hours*

The Indirect costs for the month are as under:

	Rs.
Cleaning and maintenance wages	*2,70,000*
Designing Costs	*4,50,000*
Set up costs	*3,00,000*
Manufacturing operation's costs	*6,37,500*
Shipment costs	*81,000*
Distribution costs	*3,91,500*
Factory administration costs	*2,55,000*

At present the company adopts the policy to absorb indirect costs applying direct labour hour basis and enjoying a good position in the market with regard to Product B, but facing a stiff price competition with regard to Product A. The cost Accountant of the company, after making a rigorous analysis of the data, decided to shift from the absorption technique based on direct labour hours to activity cost driver basis and also to treat cleaning and maintenance wages as direct cost.

The cost accountant identified Rs. 1,20,000 for product A and the balance of cleaning and maintenance wages for Product B.

The data relevant to activities and products are as follows:

		Product	Product
Activity	*Cost driver*	*A*	*B*
Designing:	*Square feet*	*30 sq. ft.*	*70 sq. ft.*
Manufacturing operation's:	*Moulding machine hours*	*9,000 hrs.*	*3,750 hrs.*
Shipment:	*Number of Shipments*	*100*	*100*
Distribution:	*Cubic feet*	*45,000 cu. ft.*	*22,500 cu. ft.*
Setup of moulding machine:	*Setup hours*		
Factory administration:	*Direct labour hours*		

You are required:

(i) to compute the total manufacturing cost and profits of both the products by applying direct labour basis of absorption, assuming cleaning and maintenance cost as indirect,

(ii) to compute the total manufacturing cost and profits of both the products by applying activity based costing, assuming cleaning and maintenance cost as indirect

(iii) to compare the results obtained from (i) and (ii) and give your opinion on the decision of cost accountant. *(May 2008, 10 Marks)*

Answer15

(a) Working:

Calculation of Direct Labour hours:

	Rs.
Total Indirect Costs (Rs.)*	23,85,000
Total Direct labour hours (30,000 + 9,750)	39,750
Overhead absorption rate	$\frac{\text{Rs. } 23,85,000}{39,750 \text{ hours}} = \text{Rs. } 60 \text{ per hour}$

(i) Statement showing total manufacturing costs and profits

	Product A (60,000 units)		Product B (15,000 units)		Total (Rs.)
	Per unit	Amount (Rs.)	Per unit	Amount (Rs.)	
Direct materials	18.75	11,25,000	45.00	6,75,000	18,00,000
Direct labour	10.00	6,00,000	13.00	1,95,000	7,95,000
Prime cost	28.75	17,25,000	58.00	8,70,000	25,95,000
Indirect costs (absorbed on the basis of direct labour hours)	30.00 (18,00,000/ 60,000 units)	18,00,000 (30,000 hours @ Rs. 60 per hour)	39.00 (5,85,000/ 15,000 units)	5,85,000 (9,750 hours @ Rs. 60 per hour)	23,85,000
Total cost	58.75	35,25,000	97.00	14,55,000	49,80,000
Sales	63.00	37,80,000	137.00	20,55,000	58,35,000
Profit (Sales – Total cost)	4.25	2,55,000	40.00	6,00,000	8,55,000

* Calculation of total Indirect Cost:

	Rs.
Cleaning and maintenance wages	2,70,000
Designing costs	4,50,000
Set-up costs	3,00,000
Manufacturing operations cost	6,37,500
Shipment costs	81,000
Distribution costs	3,91,500
Factory Administration Costs	2,55,000
	23,85,000

Indirect cost allocation to products A and B:

		Product A		*Product B*
Direct labour hours		30,000		*9,750*
Direct labour hour rate:	Rs.	60		60

Indirect costs	Rs. 18,00,000	*5,85,000*
Output (units)	60,000	*15,000*
Cost per unit of output	Rs. 30	*39*

Statement showing the total manufacturing costs and profits using direct labour hour basis of absorption and treating cleaning and maintenance cost as indirect cost:

	Product A		Product B		Total
	Rs./unit	Amount	Rs./unit	Amount	
Output (units)		60,000		15,000	
		Rs.		Rs.	Rs.
Sales	63.00	37,80,000	137.00	20,55,000	58,35,000
Direct Materials	18.75	11,25,000	45.00	6,75,000	18,00,000
Direct Labour	10.00	6,00,000	13.00	1,95,000	7,95,000
Prime Cost	28.75	17,25,000	58.00	8,70,000	25,95,000
Indirect costs	30.00	18,00,000	39.00	5,85,000	23,85,000
Total costs	58.75	35,25,000	97.00	14,55,000	49,80,000
Profit	4.25	2,55,000	40.00	6,00,000	8,55,000

(ii) Calculation of Setup hours

	Product A	**Product B**
Total Output (in units)	60,000	15,000
No. of quantity produced per batch	240	50
Setup time per batch	2 hours	5 hours
Setup hours (Total) (No. of batches × set up time per batch)	$\left(\frac{60,000}{240} \times 2\right) = 500$	$\left(\frac{15,000}{50} \times 5\right) = 1,500$

Calculation of Cost Driver, Rates and summary of indirect cost relating to Product A & B:

Activity and Cost Drivers	Amount (Rs.)	Cost Drivers for Product			Activity Cost Rates	Indirect Costs	
		A	B		(Amount / total of cost driver)	Product A	Product B
Cleaning & Maintenance (Direct Labour hours)	2,70,000	30,000	9,750	39,750	6.7925 per Direct labour hour	2,03,775	66,227
Designing costs (square feet)	4,50,000	30 sq. feet	70 sq. feet	100	4,500 per sq. feet	1,35,000	3,15,000
Setup costs (setup hours)	3,00,000	500 hours	1,500 hours	2,000	150 per setup hour	75,000	2,25,000
Manufacturing operations costs (molding machine hours)	6,37,500	9,000	3,750	12,750	50 per molding hours	4,50,000	1,87,500
Shipment costs (No. of shipments)	81,000	100	100	200	405 per shipment	40,500	40,500
Distribution costs (area in cubic feet)	3,91,500	45,000 cubic feet	22,500 cubic feet	67,500	5.80 per cubic feet	2,61,000	1,30,500
Factory administration costs (direct labour hours)	2,55,000	30,000	9,750	39,750	6.4151 per labour hour	1,92,453	62,547
Production (units)						13,57,728	10,27,274
						60,000	15,000
						22.63	68.48

Cost Sheet based on activity based costing system:

Description	**Product A**		Product B	
	Total cost	Per unit	Total cost	Per unit
	Rs.	Rs.	Rs.	Rs.
Sales	37,80,000	63.00	20,55,000	137.00
Direct Cost				
Direct Materials	11,25,000	18.75	6,75,000	45.00
Direct Labour	6,00,000	10.00	1,95,000	13.00
Total	17,25,000	28.75	8,70,000	58.00
Indirect costs	13,57,728	22.63	10,27,274	68.48
Total costs	30,82,728	51.38	18,97,274	126.48
Profit	6,97,272	11.62	1,57,726	10.52

(iii) Comparison of results:

Description	**Product A**		Product B	
	Traditional Costing System	Activity Based System	Traditional Costing System	Activity Based System
	Rs.	*Rs.*	*Rs.*	*Rs.*
Selling Price	63.00	63.00	137.00	137.00
Direct costs	28.75	28.75	58.00	58.00
Indirect costs	30.00	22.63	39.00	68.48
Total cost per unit	58.75	51.38	97.00	126.48
Profit per unit	4.25	11.62	40.00	10.52

Opinion:

In the traditional costing system, Product B appears to be more profitable than Product A whereas under the activity based costing system, Product A appears to be more profitable than product B. The activities like designing, set up, manufacturing operation cost, shipment and distribution are support service activities and the consumption of resources relating to these activities are not dependent on direct labour hours. The quantum of consumption of resource of each support service activity is different in respect of the two products manufactured and hence activity based costing presents a true view of cost of production. Moreover, the suggestion to treat cleaning and maintenance activity as a direct cost pool is commendable because costs should be charged direct wherever possible. The results reveal that the company should concentrate upon product B.

Alternative Solution:

Cleaning and maintenance activity will not find a place in the statement of calculation of cost driver rates. However, other cost driver rates will be unchanged.

Statement showing total cost and profits on the basis of Activity Based Costing

	Product A		Product B		Total (Rs.)
	Per unit	Amount (Rs.)	Per unit	Amount (Rs.)	
Direct materials	18.75	11,25,000	45.00	6,75,000	18,00,000
Direct labour	10.00	6,00,000	13.00	1,95,000	7,95,000
Cleaning & maintenance expenses	2.00	1,20,000*	10.00	1,50,000*	2,70,000
Prime cost	30.75	18,45,000	68.00	10,20,000	28,65,000
Indirect costs:					
Designing	2.25	1,35,000	21.00	3,15,000	4,50,000
Setup	1.25	75,000	15.00	2,25,000	3,00,000
Manufacturing operation	7.50	4,50,000	12.50	1,87,500	6,37,500
Shipments	0.67	40,500	2.70	40,500	81,000
Distribution	4.35	2,61,000	8.70	1,30,500	3,91,500
Factory administration	3.21	1,92,453	4.17	62,547	2,55,000
Total indirect costs	19.23	11,53,953	64.07	9,61,047	21,15,000
Total costs	49.98	29,98,953	132.07	19,81,047	49,80,000
Sales	63.00	37,80,000	137.00	20,55,000	58,35,000
Profits (Sales – total costs)	13.23	7,81,047	4.93	74,953	8,55,000

* The Cost Accountant identified Rs. 1,20,000 for Product A and balance Rs. 1,50,000 of cleaning and maintenance wages for Product B.

(iii) Comparison of results:

	Product A		Product B	
Allocation basis	Direct Labour Hour	Activity Based Costing	Direct Labour Hour	Activity Based Costing
Selling Price	63	63	137.00	137.00
Prime cost	28.75	30.75	58.00	68.00
Total Indirect costs	30.00	19.23	39.00	64.07
Total costs (Prime cost + Total indirect costs)	58.75	49.98	97.00	132.07
Profit per unit	4.25	13.02	40.00	4.93

Comments:

It is evident from the comparison of results that under single cost pool system the product A is overcost and product B is undercost. This is due to allocation of indirect cost on the basis of blanket rate based on direct labour hour and considering one of the significant cost as an indirect one. Cost Accountant's decision for allocation of indirect costs on the basis of ABC methods and identifying be cleaning and maintenance cost as direct element of cost appears to be a good decision. Result show that the firm enjoys competitive advantage with regards to product A.

6
Non-integrated, Integrated & Reconciliation of Cost and Financial Accounts

Question 1

Write short note on Cost Ledger Control Account *(May, 1996, 4 marks)*

Answer

Cost Ledger Control Account: This control account is also popularly know as 'General Ledger Adjustment Account' is opened in Cost Ledger to complete double-entry. All items of income and expenditure taken from financial accounts and all transfers from cost accounts to financial books are recorded in this account. Since the purpose of this account is to complete double entry in the cost ledger, therefore all transactions in the cost ledger must be recorded through the 'Cost Ledger Control Account'. The balance in this account will always be equal to the total of all the balances of the impersonal accounts.

Question 2

After the annual stock taking you come to know of some significant discrepancies between book stock and physical stock. You gather the following information:

Items	*Stock Card*	*Stores Ledger*	*Physical Check*	*Cost/Unit*
	Units	*Units*	*Units*	*Rs.*
A	*600*	*600*	*560*	*60*
B	*380*	*380*	*385*	*40*
C	*750*	*780*	*720*	*10*

(a) What action should be taken to record the information shown above.

(b) Suggest reasons for the shortage and discrepancies disclosed above and recommend a possible course of action by management to prevent future losses.

(Your answer should be in points and you need not elaborate).

Answer

(a) *For recording the information shown in the question under consideration, the following action may be taken:*

(i) Check the stock card and stores ledger. The correct physical quantity be recorded.

(ii) Investigate reasons for stock losses or gains.

(iii) After ascertaining the reasons for stock losses the following treatment may be followed:

(a) Debit Factory overhead A/c

Credit Stores Ledger Control a/c

(if the shortage is normal)

(b) Debit Costing P & L A/c

Credit Stores Ledger Control A/c

(if the shortage is abnormal)

(c) Debit Work-in-progress A/c

Credit Stores Ledger Control A/c

(if the shortage is due to non-recording or short recording etc.)

(iv) Rectification entry may be passed for clerical errors.

(v) After ascertaining the reason for stock gains an appropriate action may be taken as follows:

(a) Debit Stores Ledger A/c

Credit Factory Overhead A/c

(if the excess of stock is due to normal causes)

(b) Debit Stores Ledger Control A/c

Credit Costing P & L A/c

(if the excess of stock is due to abnormal circumstances)

(c) Debit Stores Ledger Control A/c

Credit Work-in-progress A/c

(if the excess stock is due to wrong recording etc.)

(vi) n the given example, the losses are with reference to items A (Rs. 60 x 40 units = Rs. 2,400 and C (Rs. 10 x 60 = Rs. 600). As the reasons for those losses are not given therefore they may be decided to P/L A/c and Stores Ledger Control A/c be credited accordingly.

(vii) The gains are in respect of stock item B (Rs. 40 x 5 = Rs.200). For treating gain of Rs. 200 Stores Ledger Control A/c be debited and Costing P/L A/c credited.

(b) Reason for the shortage and discrepancies:

(i) Wastage of material due to spoilage, evaporation etc. which may be normal or abnormal.

(ii) Components issued for production without entry on stock card and stores ledger.

(iii) Stores staff misreading figures on the requisitions.

(iv) Theft of stock from stores.

(v) Clerical errors in stores ledger.

Recommended Course of action to prevent future losses

(i) Entry in the stores should be restricted to authorised persons only.

(ii) All issues of stock should be against proper stock requisition slip.

(ii) Stores should follow a system of internal check for all items of stock.

(iii) Proper accounting be done for all stock movements.

(iv) Recording of entries in stores ledger and stock card should be made carefully.

(v) Stock items which come first in the stores should be issued first to avoid loses due to deterioration or obsolescence.

Question 3

What are the essential pre-requisites of integrated accounting system?

(Nov, 1996, 2001, 2008, 4, 3 marks)

Answer

Essential pre-requisites of Integrated Accounting System:

The essential pre-requisites of integrated accounting system include the following:

1. The management's decision about the extent of integration of the two sets of books. Some concerns find it useful to integrate upto the stage of primary cost or factory cost while other prefer full integration of the entire accounting records.
2. A suitable coding system must be made available so as to serve the accounting purposes of financial and cost accounts.
3. An agreed routine, with regard to the treatment of provision for accruals, prepaid expenses, other adjustment necessary for preparation of interim accounts.
4. Perfect coordination should exist between the staff responsible for the financial and cost aspects of the accounts and an efficient processing of accounting documents should be ensured.

Under this system there is no need for a separate cost ledger. Of course, there will be a number of subsidiary ledgers; in addition to the useful Customers Ledger and the Bought Ledger, there will be : (a) Stores Ledger; (b) Stock Ledger and (c) Job Ledger.

Question 4

What are the advantages of integrated accounting? (Nov.,1997,May, 2002, 4 marks)

Answer

Advantages of Integrated Accounting:

Integrated Accounting is the name given to a system of accounting whereby cost and financial accounts are kept in the same set of books. Such a system will have to afford full information required for Costing as well as for Financial Accounts. In other words, information and data should be recorded in such a way so as to enable the firm to ascertain the cost (together with the necessary analysis) of each product, job, process, operation or any other identifiable activity. For instance, purchases are analysed by nature of material and its end-use. Purchases account is eliminated and direct postings are made to Stores Control Account, Work-in-Progress account, or Overhead Account. Payroll is straightway analysed into direct labour and overheads. It also ensures the ascertainment of marginal cost, variances, abnormal losses and gains. In fact all information that management requires from a system of Costing for doing its work properly is made available. The integrated accounts give full information in such a manner so that the profit and loss account and the balance sheet can be prepared according to the requirements of law and the management maintains full control over the liabilities and assets of its business.

The main advantages of Integrated Accounting are as follows:

(i) Since there is one set of accounts, thus there is one figure of profit. Hence the question of reconciliation of costing profit and financial profit does not arise.

(ii) There is no duplication of recording of entries and efforts to maintain separate set of books.

(iii) Costing data are available from books of original entry and hence no delay is caused in obtaining information.

(iv) The operation of the system is facilitated with the use of mechanized accounting.

(v) Centralization of accounting function results in economy.

Question 5

What do you understand by integrated accounting system? State its advantages and pre-requisites.

Answer

Integrated (or Integral) Accounts is the name given to a system whereby cost and financial accounts are kept in the same set of books. Obviously, then there will be no separate sets of books for Costing and Financial purposes. Integrated Accounts will have to afford full information required for Costing as well as for Financial Accounts. In other words, information and data should be recorded in such a way as to enable the firm to ascertain the Cost (together with the necessary analysis) of each product, job, process, operation or any other identifiable activity. For instance, purchases are analysed by nature of material and its end-use. Purchase accounts are eliminated and direct postings are made to Stores Control Account, Work-in-Progress Account, or Overhead Account. Payroll is straightway analysed

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The essential pre-requisites for integrated accounts include the following steps.

1. The management's decision about the extent of integration of two sets of books. Some concerns find it useful to integrate upto the stage of primary cost or factory cost while others prefer full integration of the entire accounting records.
2. A suitable coding system must be made available so as to serve to accounting purposes of financial and cost accounts.
3. An agreed routine, with regard to the treatment of provision for accruals, prepaid expenses, and other adjustments necessary for preparation of interim accounts.
4. Perfect co-ordination should exist between the staff responsible for the financial and cost aspects of the accounts and an efficient processing of the accounting documents should be ensured.

Question 6

Write notes on Integrated Accounting *(May, 1999, 1998, 4 marks)*

Answer

Integrated Accounting

Integrated Accounting is the name given to a system of accounting whereby cost and financial accounts are kept in the same set of books. Such a system will have to afford full information required for costing as well as for Financial Accounts. In other words, information and data should be recorded in such a way so as to enable the firm to ascertain the cost (together with the necessary analysis) of each product, job, process, operation or any other identifiable activity. For instance, purchases analysed by nature of material and its end use. Purchases account is eliminated and direct postings are made to Stores Control Account, Work-in-Progress accounts, or Overhead Account. Payroll is straightway analysed into direct

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Question 7

Why is it necessary to reconcile the Profits between the Cost Accounts and Financial Accounts? (May, 2004, 5 marks)

Answer

When the cost and financial accounts are kept separately, It is imperative that these should be reconciled, otherwise the cost accounts would not be reliable. The reconciliation of two set of accounts can be made, if both the sets contain sufficient detail as would enable the causes of differences to be located. It is, therefore, important that in the financial accounts, the expenses should be analysed in the same way as in cost accounts. It is important to know the causes which generally give rise to differences in the costs & financial accounts. These are:

(i) Items included in financial accounts but not in cost accounts Appropriation of profits

- Income-tax
- Transfer to reserve
- Dividends paid
- Goodwill / preliminary expenses written off

Pure financial items

- Interest, dividends
- Losses on sale of investments
- Expenses of Co's share transfer office
- Damages & penalties

(ii) Items included in cost accounts but not in financial accounts

- Opportunity cost of capital
- Notional rent

(iii) Under / Over absorption of expenses in cost accounts

(iv) Different bases of inventory valuation

Motivation for reconciliation are:

- To ensure reliability of cost data
- To ensure ascertainment of correct product cost
- To ensure correct decision making by the management based on Cost & Financial data
- To report fruitful financial / cost data.

Question 8

What are the reasons for disagreement of profits as per cost accounts and financial accounts? Discuss. *(May, 2000, 4 marks)*

Answer

Reasons for disagreement of profits as per cost and financial accounts

The various reasons for disagreement of profits shown by the two sets of books viz., cost and financial may be listed as below:

1. Items appearing only in financial accounts

The following items of income and expenditure are normally included in financial accounts and not in cost accounts. Their inclusion in cost accounts might lead to unwise managerial decisions. These items are:

(i) Income:

(a) Profit on sale of assets

(b) Interest received

(c) Dividend received

(d) Rent receivable

(e) Share Transfer fees

(ii) Expenditure

(a) Loss on sale of assets

(b) Uninsured destruction of assets

(c) Loss due to scrapping of plan and machinery

(d) Preliminary expenses written off

(e) Goodwill written off

(f) Underwriting commission and debenture discount written off

(g) Interest on mortgage and loans

(h) Fines and penalties

(iii) Appropriation

(a) Dividends

(b) Reserves

(c) Dividend equalization fund, Sinking, fund etc.

2. Items appearing only in cost accounts

There are some items which are included in cost accounts but not in financial account.

These are:

(a) Notional interest on capital;

(b) Notional rent on premises owned.

3. Under or over-absorption of overhead

In cost accounts overheads are charged to production at pre-determined rates where in financial accounts actual amount of overhead is charged, the difference gives rise under- or over-absorption; causing a difference in profits.

4. Different bases of stock valuation

In financial books, stocks are valued at cost or market price, whichever is lower. In cost books, however, stock of materials may be valued on FIFO or LIFO basis and work-in-progress may be valued at prime cost or works cost. Differences in store valuation may thus cause a difference between the two profits.

5. Depreciation

The amount of depreciation charge may be different in the two sets of books either because of the different methods of calculating depreciation or the rates adopted. In company accounts, for instance, the straight line method may be adopted whereas in financial accounts It may be the diminishing balance method.

Question 9

'Reconciliation of cost and financial accounts in the modern computer age is redundant'. Comment. *(May, 1998, 4 marks)*

Answer

In the modern computer age the use of computer knowledge and accounting softwares has helped the field of Financial and Cost Accounting in a big way. In fact, computers work at a very high speed and can process voluminous data for generating desired output in no time. Output produced is precise and accurate. Computers can work for hours without any fatigue. They can bring out different Financial Accounting and Cost Accounting statements and reports accurately in a presentable form. Financial accounts and Cost accounts show their results accurately and precisely, when maintained on a computer system, but the profit shown by one set of books may not agree with that of the other set.

The main reasons for the disagreement of the profit figures shown by the two set of books is the absence of certain items which appear in financial books only and are not recorded in cost accounting books. Similarly, there may be some items which appear in cost accounts but do not find a place in the financial books. Some examples which affects it are as below:

(i) Loss/profit on sale of fixed assets.

(ii) Expenses on stamp duty, discount and other expenses relating to the issue and transfer of shares and debentures.

(iii) Fee received on issue and transfer of shares etc.

(iv) Interest on bank loan, mortgage etc.

(v) Interest received on bank deposits and other investments.

(vi) Fines and penalties

(vii) Dividend received on investments in shares.

(viii) Rental income etc.

(ix) Under or over recovered expenses.

(x) Difference due to varying basis of valuation of stock or in the matter of charging depreciation.

Under the situation of differential profit figure shown by financial and cost accounts, it is necessary to reconcile the results (profit/loss) shown. Such a reconciliation proves arithmetical accuracy of data, explains reasons for the difference in two sets of books and affords reliability to them. Hence, the reconciliation of cost and financial accounts is essential and not redundant even in the modern age of computer.

Question 10

What are the reasons for disagreement of Profits as per Financial accounts and Cost accounts? Discuss? *(Nov, 1999, 4 marks)*

Answer

Reasons for disagreement of 'Profits as per Financial accounts and Cost accounts are as below. There are certain items which are included in Financial accounts but not in Cost Accounts. Likewise there are certain items which are in Cost Accounts but not in Financial accounts.

Examples of financial charges which appear only in financial books are:

(i) Loss on the sale of fixed assets and investments.

(ii) Interest on bank loans, mortgage etc.

(iii) Expenses relating to the issue and transfer of shares and debentures like stamps duty expenses; discount on shares and debentures etc.

(iv) Penalties and fines.

Examples of incomes which are recorded in the financial books only are:

(i) Profit on the sale of investments and fixed assets.

(ii) Interest received on investments and bank deposits.

(iii) Dividend received on investment in shares.

(iv) Fees received on issue and transfer of shares etc.

(v) Rental income.

There are abnormal or special items of expenditure and income which are not included in the cost of production. Their inclusion in cost of production, would result into incorrect cost ascertainment. Different bases of charging depreciation also accounts for the disagreement of profits as per financial and cost accounts. Different methods of valuation of closing stock adopted in cost and financial accounts will also account for the difference in profits under financial and cost accounts.

Question 11

Why is it necessary to reconcile the Profit between Cost Accounts and Financial Accounts?

(Nov, 2002, 5 marks)

Answer

Need for reconciliation: When cost and financial accounts are maintained separately, the profit shown by one set of books may not agree with that of the other set. In such a situation, it becomes necessary to reconcile the results (profit / loss) shown by two sets of books.

Causes for difference between profit shown by cost and financial accounts

(i) There are certain items which appear in financial books only and are not recorded in cost accounting books e.g. loss on sale of fixed assets; expenses on stamp duty; interest on bank loan etc. Similarly, there may be some items which appear in cost accounts only and do not find a place in the financial books e.g. notional rent; national interest etc.

(ii) In cost accounts, overheads are generally absorbed on the basis of a pre-determined overhead rate, whereas in financial accounts actual expenditure on overheads is recorded, this will also cause a difference between the figure of profit shown under financial and cost account.

(ii) Different methods of valuation of closing stock adopted in cost and financial accounts will also cause a difference in the results shown by the two sets of books. In financial accounts the method generally followed is cost or market price, whichever is less whereas in cost accounts different methods of pricing of material issues such as LIFO, FIFO, average etc are used.

(iii) Use of different methods of depreciation is also responsible for the variation of profit shown by two sets of books. In financial accounts, depreciation may be charged according to written down value method whereas in cost accounts is may be charged on the basis of the life of the machine.

(iv) Abnormal items not included in cost accounts also causes a difference in profit. If such items of expenses are included, cost ascertained will not be correct.

Question 12

From the following data write up the various accounts as you envisage in the cost ledger and prepare a trial balance as on 31st March 1984.

(a) Balance as on 1st April 1983:

	Rs. (in thousands)
Material Control	*1,240*
Work-in-Progress	*625*
Finished Goods	*1,240*
Production Overhead	*84*
Administrative Overhead	*120 (cr.)*
Selling & Distribution Overhead	*65*
General Ledger control	*3,134*

(b) Transactions for the year ended 31st March 1984

Material	
Purchases	*4,801*
Issued to :	
Jobs	*4,774*
Maintenance works	*412*

Administration offices	*34*
Selling Department	*72*
Direct Wages	*1,493*
Indirect Wages	*650*
Carriage Inward	*84*
Production Overheads:	
Incurred	*2,423*
Absorbed	*3,591*
Administration overheads:	
Incurred	*740*
Allocated to Production	*529*
Allocated to sales	*148*
Sales overheads:	
Incurred	*642*
Absorbed	*820*
Finished goods produced	*9,584*
Finished goods sold	*9,773*
Sales realisation	*12,430*

Answer

Cost Ledger

General Ledger Adjustment Account

Dr.			*Cr.*
	Rs. '000		*Rs. '000*
To Costing Profit & Loss A/c		By Balance b/d	3,134
(Sales)	12,430	By Material Control A/c	4,801
To Balance c/d	3,226	By Wage Control A/c	2,143
		By Production Overhead Control A/c (carriage)	84
		By Production Overhead Control A/c	2,423
		By Administration Overhead Control A/c	740
		By Selling & Dist. Control A/c	642
		By Costing Profit & Loss A/c	1,689
	15,656		15,656

Material Control Account

Dr.			*Cr.*
	Rs. '000		*Rs.' 000*
To Balance b/d	1,240	By WIP Control A/c	4,774
To General Ledger Adjustment A/c	4,801	By Production Overhead Control A/c	412
		By Administration Overhead Control A/c	34
		By Selling & Dist. Overhead Control A/c	72
	____	By Balance c/d	749
	6,041		6,041

Wages Control Account

Dr.			*Cr.*
	Rs.'000		*Rs. '000*
To General Ledger Adjustment A/c	2,143	By WIP Control A/c	1,493
		By Production Overhead Control A/c	650
	2,143		2,143

Production Overhead Control Account

Dr.			*Cr.*
	Rs.'000		*Rs' 000*
To Balance b/d	84	By WIP control A/c	3,591
To Material Control A/c	412	By Balance c/d	62
To General Ledger Adjustment A/c	84		
To Wages Control A/c	650		
To General Ledger Adjustment A/c	2,423		____
	3,653		3,653

Work-in progress Control Account

Dr.			*Cr.*
	Rs.' 000		*Rs.'000*
To Balance b/d	625	By Finished Goods Control A/c	9,584
To Material Control A/c	4,774		
To Wages Control A/c	1,493	By Balance c/d	899
To Production Overhead Control A/c	3,591		____
	10,483		10,483

Administrative Overhead Control Account

Dr.			*Cr.*
	Rs.'000		*Rs.'000*
To Material Control A/c	34	By Balance b/d	120
To General Ledger Adjustment A/c	740	By Finished Goods Control A/c	529
To Balance c/d	23	By Cost of Sales A/c	148
	797		797

Finished Goods Control Account

Dr.			*Cr.*
	Rs.' 000		*Rs.' 000*
To Balance b/d	1,240	By Cost of Sales A/c	9,773
To Administrative Overhead Control A/c	529	By Balance c/d	1,580
To WIP Control A/c	9,584		
	11,353		11,353

Selling & Distribution Overhead Control Account

Dr.			*Cr.*
	Rs. '000		*Rs. '000*
To Balance b/d	65	By Cost of Sales A/c	820
To Material Control A/c	72		
To General Ledger Adjustment A/c	642		
To Balance c/d	41		
	820		820

Cost of Sales Account

Dr.			*Cr.*
	Rs.' 000		*Rs.' 000*
To Finished Goods Control A/c	9,773	By Costing Profit & Loss A/c	10,741
To Selling & Dist. Overhead Control A/c	820		
To Admn. Overhead Control A/c	148		
	10,741		10,741

Costing Profit & Loss Account

Dr.			*Cr.*
	Rs. '000		*Rs. '000*
To Cost of Sales A/c	10,741	By General Ledger	12,430
To General Ledger	1,689	Adjustment A/c	
Adjustment A/c	____	(Sales)	____
	12,430		12,430

Trial Balance as on 31st March, 1984

	Dr.	*Cr.*
	Rs. '000	*Rs.' 000*
Material Control A/c	749	
Work-in-progress Control A/c	899	
Finished Goods Ledger Control A/c	1,580	
Production Overhead Control A/c	62	
Admn. Overhead Control A/c		23
Selling & Dist. Overhead control A/c		41
General Ledger Adjustment A/c	___	3,226
	3,290	3,290

Note : Administrative Overheads are generally charged to Finished Goods A/c. Hence the expression in the question 'Administrative overheads allocated to production'' has been interpreted as 'Administrative overheads allocated to finished production' and accordingly charged to Finished Goods A/c.

Question 13

The following balances are shown in the cost ledger of Vinak Ltd. As on 31st Oct. 1981:

	Dr. (Rs.)	*Cr. (Rs.)*
Work in Progress Account	*7,056*	
Factory Overhead Suspense Account	*360*	
Finished Stock Account	*5,274*	
Stores Ledger account	*9,450*	
Admn. Overhead Suspense Account	*180*	
General Ledger Adjustment Account		*22,320*

Transactions for the year ended 30th September 1982 were:

	Rs.
Stores issued to production	*45,370*
Stores purchased	*52,400*
Material purchased for direct issue to production	*1,135*
Wages paid (Including indirect labour Rs. 2,520)	*57,600*
Finished goods sold	*1,18,800*
Administration expenses	*5,400*
Selling expenses	*6,000*
Factory overheads	*15,600*
Stores issued for capital work in progress	*1,500*

	Rs.
Finished goods transferred to warehouse	*1,08,000*
Stores issued for factory repairs	*2,000*
Factory overheads applied to production	*16,830*
Adm. Overheads charged to production	*4,580*
Factory overheads applicable to unfinished work	*3,080*
Selling overheads allocated to sales	*5,500*
Stores lost due to fire in stores (Not insured)	*150*
Administration expenses on unfinished work	*850*
Finished goods stock on 30-9-1982	*14,274*

You are required to record the entries in the cost ledger for the year ended 30th September, 1982 and prepare a trial balance as on that date.

Answer

Cost Ledger

General Ledger Adjustment Account

Dr.			*Cr.*
	Rs.		*Rs.*
To Cost of Sales A/c	1,18,800	By Balance b/d	22,320
To Balance c/d	54,585	By Stores ledger control A/c	52,400
		By WIP control A/c	1,135
		By Wages control A/c	57,600

		By Factory Overhead control A/c	15,600
		By Admn. Overhead control A/c	5,400
		By Selling Overhead control A/c	6,000
	_____	By Costing Profit & Loss A/c	12,930
	1,73,385		1,73,385

Stores Ledger Control Account

	Rs.		*Rs.*
To Balance b/d	9,450	By WIP Control A/c	45,370
To Gen. Ledger Adj. A/c	52,400	By Capital WIP A/c	1,500
		By Factory Overhead control A/c	2,000
		By Costing P/L A/c	150
	_____	By Balance c/d	12,830
	61,850		61,850

Work-in Progress Control A/c

	Rs.		*Rs.*
To Balance b/d	7,056	By Finished Goods Control A/c	1,08,000
To Gen. Ledger Adj. A/c	1,135		
To Stores Ledger Control A/c	45,370	By Balance c/d	22,051
To Wages Control A/c	55,080		
To Factory Overhead Control A/c	16,830		
To Admn. Overhead Control A/c	4,580		_____
	1,30,051		1,30,051

Finished Goods Control Account

	Rs.		*Rs.*
To Balance b/d	5,274	By Cost of Sales A/c	99,000
To WIP Control A/c	1,08,000	By Balance c/d	14,274
	1,13,274		1,13,274

Wages Control Account

	Rs.		*Rs.*
To Gen. Ledger Adj. A/c	57,600	By WIP Control A/c	55,080
	_____	By Factory Overhead Control A/c	2,520
	57,600		57,600

Factory Overhead Control Account

	Rs.		Rs.
To Factory overhead suspense A/c	360	By WIP Control A/c	16,830
To Gen. Ledger Adj. A/c	15,600	By Factory Overhead Suspense A/c	3,080
To Stores Ledger Control A/c	2,000	By Costing Profit & Loss A/c	570
To Wages Control A/c	2,520		
	20,480		20,480

Administrative Overhead Control Account

	Rs.		Rs.
To Admn. Overhead Suspense A/c	180	By WIP Control A/c	4,580
To Gen. Ledger Adj. A/c	5,400	By Admn. Overhead Susp. A/c	850
		By Costing Profit & Loss A/c	150
	5,580		5,580

Cost Sales Account

	Rs.		Rs.
To Finished Goods Control A/c	99,000	By Costing Profit & Loss A/c	1,04,500
To Selling Overhead Control A/c	5,500		
	1,04,500		1,04,500

Factory Overhead Suspense Account

	Rs.		Rs.
To Balance b/d	360	By Factory Overhead Control A/c	360
To Factory Overhead Control A/c	3,080	By Balance c/d	3,080
	3,440		3,440

Administration Overhead Suspense Account

	Rs.		Rs.
To Balance b/d	180	By Admn. Overhead Control A/c	180
To Administrative Overhead Control A/c	850	By Balance c/d	850
	1,030		1,030

Selling Overhead Control Account

	Rs.		Rs.
To Balance b/d	6,000	By Cost of Sales A/c	5,500
		By Costing Profit & Loss A/c	500
	6,000		6,000

Capital Work in Progress Account

	Rs.		*Rs.*
To Stores Ledger Control A/c	1,500	By Balance c/d	1,500
	1,500		1,500

Costing Profit & Loss Account

	Rs.		*Rs.*
To Cost of Sales A/c	1,04,500	By Gen. Ledger Adj. A/c	1,18,800
To Stores Ledger Control A/c	150		
To Factory Overhead Control A/c	570		
To Selling Overhead Control A/c	500		
To Admn. Overhead Control A/c	150		
To Gen. Ledger Adj. A/c (Profit)	12,930		
	1,18,800		1,18,800

Trial Balance

	Dr.(Rs.)	*Cr.(Rs.)*
Work-in-Progress A/c	22,051	
Stores Ledger Control A/c	12,830	
Finished Goods Control A/c	14,274	
Factory Overhead Suspense A/c	3,080	
Admn. Overhead Suspense A/c	850	
Capital Work in Progress A/c	1,500	
Gen. Ledger Adjustment A/c		54,585
	54,585	54,585

Question 14

Pass journal entries in the cost books, maintained on non-integrated system, for the following:

(i) Issue of materials:	*Direct Rs. 5,50,000; Indirect Rs. 1,50,000*
(ii) Allocation of wages:	*Direct Rs. 2,00,000; Indirect Rs. 40,000*
(iii) Under/Over absorbed overheads:	*Factory (over) Rs. 20,000;*
	Administration (under) Rs. 10,000

(Nov, 2000, 6 marks)

Answer

Journal Entries in Cost Books
Maintained on non-integrated system

		Rs.	*Rs.*
(i) Work-in-Progress Ledger Control A/c	Dr.	5,50,000	
Factory Overhead Control A/c	Dr.	1,50,000	
To Stores Ledger Control A/c			7,00,000
(Being issue of materials)			
(ii) Work-in Progress Ledger Control A/c	Dr.	2,00,000	
Factory Overhead control A/c	Dr.	40,000	
To Wages Control A/c			2,40,000
(Being allocation of wages and salaries)			
(iii) Factory Overhead Control A/c	Dr.	20,000	
To Costing Profit & Loss A/c			20,000
(Being transfer of over absorption of overhead)			
Costing Profit & Loss A/c	Dr.	10,000	
To Administration Overhead Control A/c			10,000
(Being transfer of under absorption of overhead)			

Question 15

A company operates on historic job cost accounting system, which is not integrated with financial accounts. At the beginning of a month, the opening balances in cost ledger were.

	Rs. (in lakhs)
Stores Ledger Control Account	*80*
Work-in-Progress Control Account	*20*
Finished Goods Control Account	*430*
Building Construction Account	*10*
Cost Ledger Control Account	*540*

During the month, the following transactions took place:

Material	*Purchased*	*40*
	Issued to production	*50*
	Issued to general maintenance	*6*
	Issued to building construction	*4*
Wages	*Gross wages paid*	*150*
	Indirect wages	*40*

	For building construction	*10*
Works Overheads	*Actual amount incurred (excluding items shown above)*	*160*
	Absorbed in building construction	*20*
	Under absorbed	*8*
Rayalty paid		
Selling, distribution and administration overheads sales		

At the end of the month, the stock of raw material and work-in-progress was Rs. 55 lakhs Rs. 25 lakhs respectively. The loss arising in the raw material account is treated as factory overhead. The building under construction was completed during the month. Company's gross profit margin is 20% on sales.

Prepare the relevant control accounts to record the above transactions in the cost ledger of company. (May, 1996, 16 marks)

Answer

Cost Ledger Control A/c

(Rs. In lakhs)

Dr.			*Cr.*
	Rs.		*Rs.*
To Costing P & L A/c	450	By Balance b/d	540
To Stores Ledger Control A/c	55	By Stores Ledger Control A/c	40
To WIP Control A/c	25	By Wages Control A/c	150
To Building Const. A/c	44	By Works Overhead Control A/c	160
To Finished Goods Control A/c	403	By Royalty A/c	5
		By Selling Distribution and Administration Overheads A/c	25
	___	By Costing Profit & Loss A/c	57
	977		977

Stores Ledger Control A/c

Dr.			*Cr.*
	Rs.		*Rs.*
To Balance b/d	80	By WIP Control A/c	50
To Cost Ledger Control A/c	40	By Works Overhead Control A/c	6
		By Building Const. A/c	4

		By Closing Balance	55
		By Work Overhead Control A/c (Loss)	5
	120		120

Work-in-Progress Control A/c

Dr.			*Cr.*
	Rs.		*Rs.*
To Balance b/d	20	By Finished Goods Control A/c	333
To Stores Ledger Control A/c	50	By Closing Balance	25
To Wage Control A/c	100		
To Works Overhead Control A/c	183		
To Royalty A/c	5		
	358		358

Finished Goods Control A/c

Dr.			*Cr.*
	Rs.		*Rs.*
To Balance b/d	430	By Cost of Goods Sold A/c *(Refer Working Note)*	360
To WIP Control A/c	333	By Balance	403
	763		763

Cost of Sales A/c

Dr.			*Cr.*
	Rs.		*Rs.*
To Cost of Goods Sold A/c	360	By Costing P & L A/c	385
To Selling, Distribution and Administration Overheads A/c	25		
	385		385

Costing P & L A/c

Dr.			*Cr.*
	Rs.		*Rs.*
To Cost of Sales A/c	385	By Cost Ledger Control A/c	450
To Works Overhead Control A/c	8		
To Cost Ledger Control A/c (Profit)	57		
	450		450

Building Construction A/c

Dr.			*Cr.*
	Rs.		
To Balance b/d	10	By Cost Ledger Control A/c	44
To Stores Ledger Control A/c	4		
To Wage Control A/c	10		
To Works Overhead Control A/c	20		
	44		44

Works Overhead Control A/c

Dr.			*Cr.*
	Rs.		*Rs.*
To Stores Ledger Control A/c	6	By Building Construction A/c	20
To Wage Control A/c	40	By WIP Control A/c	183
To Cost Ledger Control A/c	160	By Balance (Costing P & L A/c)	8
To Stores Ledger Control A/c (Loss)	5		
	211		211

Wages Control A/c

Dr.			*Cr.*
	Rs.		*Rs.*
To Cost Ledger Control A/c	150	By Works Overhead Control A/c	40
		By Building Const. A/c	10
		By WIP Control A/c	100
	150		150

Royalty A/c

Dr.			*Cr.*
	Rs		*Rs.*
To Cost Ledger Control A/c	5	By WIP Control A/c	5
	5		5

Cost of Goods Sold A/c

Dr.			*Cr.*
	Rs.		*Rs.*
To Finished Goods Control A/c	360	By Cost of Sales A/c	360
	360		360

Selling, Distribution and Administration Overheads A/c

Dr.			*Cr.*
	Rs.		*Rs.*
To Cost Ledger Control A/c	25	By Cost of Sales A/c	25
	25		25

Trial Balance

		Rs. In (lakhs)
	Dr.	*Cr.*
To Stores Ledger Control A/c	55	
To WIP Control A/c	25	
To Finished Goods Control A/c	403	
To Cost Ledger Adjustment A/c	—	483
	483	483

Working Note

If S.P. is Rs. 100 then C.P. = Rs. 80

If S.P. is Rs. 450 then C.P. = Rs. $\frac{80}{100}$ × Rs. 450 = 360 lakhs.

Question 16

A Company operates separate cost accounting and financial accounting systems. The following is the list of Opening balances as on 1.04.2001 in the Cost Ledger.

	Debit	*Credit*
	Rs.	*Rs.*
Stores Ledger Control Account	*53,375*	--
WIP Control Account	*1,04,595*	--
Finished Goods Control Account	*30,780*	--
General Ledger Adjustment Account		*1,88,750*

Transactions for the quarter ended 30.06.2001 are as under:

	Rs.
Materials purchased	*26,700*
Materials issued to production	*40,000*
Materials issued for factory repairs	*900*
Factory wages paid (including indirect wages Rs. 23,000)	*77,500*
Production overheads incurred	*95,200*
Production overheads under-absorbed and written-off	*3,200*
Sales	*2,56,000*

The Company's gross profit is 25% on Factory Cost. At the end of the quarter, WIP stocks increased by Rs. 7,500.

Prepare the relevant Control Accounts, Costing Profit and Loss Account and General Ledger Adjustment Account to record the above transactions for the quarter ended 30.06.2001.

(Nov, 2001, 10 marks)

Answer

General Ledger Adj. A/c

Dr.			*Cr.*
Particulars	*Rs.*	*Particulars*	*Rs.*
To Sales	2,56,000	By Balance b/d	1,88,750
To Balance c/d	1,80,150	By Stores ledger control A/c	26,700
		By Wages control A/c	77,500
		By Overheads control A/c	95,200
	_____	By Costing Profit & Loss A/c	48,000
	4,36,150		4,36,150

Stores ledger control A/c

Dr.			*Cr.*
Particulars	*Rs.*	*Particulars*	*Rs.*
To Balance b/d	53,375	By WIP control A/c	40,000
To General ledger adj. A/c	26,700	By Factory overhead control A/c	900
	____	By Balance c/d	39,175
	80,075		80,075

WIP control A/c

Dr.			*Cr.*
Particulars	*Rs.*	*Particulars*	*Rs.*
To Balance b/d	1,04,595	By Finished goods control A/c	2,02,900
To Stores ledger control A/c	40,000	By Balance c/d	1,12,095
To Wages control A/c	54,500		
To Factory, O/H control A/c	1,15,900		_____
	3,14,995		3,14,995

Finished goods control A/c

Dr.			*Cr.*
Particulars	*Rs.*	*Particulars*	*Rs.*
To Balance b/d	30,780	By Cost of sales A/c *(Refer to note)*	2,04,800
To WIP control A/c	2,02,900	By Balance c/d	28,880
	2,33,680		2,33,680

Note:

Gross profit is 25% of Factory cost or 20% on sales.

Hence cost of sales = Rs. 2,56,000 – 20% of Rs. 2,56,000 = Rs. 2,04,800

Factory overhead control A/c

Dr.			*Cr.*
Particulars	*Rs.*	*Particulars*	*Rs.*
To Stores ledger control A/c	900	By Costing & profit loss A/c	3,200
To Wages control A/c	23,000	By WIP control A/c	1,15,900
To General ledger adj. A/c	95,200		
	1,19,100		1,19,100

Cost of sales A/c

Dr.			*Cr.*
Particulars	*Rs.*	*Particulars*	*Rs.*
To Finished goods control A/c	2,04,800	By Costing Profit & Loss A/c	2,04,800

Sales A/c

Dr.			*Cr.*
Particulars	*Rs.*	*Particulars*	*Rs.*
To Costing Profit & Loss A/c	2,56,000	By GLA A/c	2,56,000

Wages control A/c

Dr.			*Cr.*
Particulars	*Rs.*	*Particulars*	*Rs.*
To General ledger adj. A/c	77,500	By Factory overhead control A/c	23,000
		By WIP control A/c	54,500
	77,500		77,500

Costing Profit & Loss A/c

Dr.			*Cr.*
Particulars	*Rs.*	*Particulars*	*Rs.*
To Factory O H Control A/c	3,200	By Sales A/c	2,56,000
To Cost of sales A/c	2,04,800		
To General ledger adj. A/c	48,000		
(Profit)	_____		_____
	2,56,000		2,56,000

Trial Balance (as on 30.6.2001)

Dr.		*Cr.*
	Rs.	*Rs.*
Stores ledger control A/c	39,175	
WIP control A/c	1,12,095	
Finished goods control A/c	28,880	
To General ledger adjustment A/c	_____	1,80,150
	1,80,150	1,80,150

Question 17

A fire destroyed some accounting records of a company. You have been able to collect the following from the spoilt papers/records and as a result of consultation with accounting staff in respect of January 1997:

(i) Incomplete Ledger Entries:

Raw-Materials A/c

	Rs.		*Rs.*
Beginning Inventory	*32,000*		

Work-in-Progress A/c

	Rs.		*Rs.*
Beginning Inventory	*9,200*	*Finished Stock*	*1,51,000*

Creditors A/c

	Rs.		*Rs.*
		Opening Balance	*16,400*
Closing Balance	*16,200*		

Manufacturing Overheads A/c

	Rs.		*Rs.*
Amount Spent	*29,600*		

Finished Goods A/c

	Rs.		*Rs.*
Opening Inventory	*24,000*		
		Closing Inventory	*30,000*

(ii) Additional Information:

(1) The cash-book showed that Rs. 89,200 have been paid to creditors for raw-material.

(2) Ending inventory of work-in-progress included material Rs. 5,000 on which 300 direct labour hours have been booked against wages and overheads.

(3) The job card showed that workers have worked for 7,000 hours. The wage rate is Rs. 10 per labour hour.

(4) Overhead recovery rate was Rs. 4 per direct labour hour.

You are required to complete the above accounts in the cost ledger of the company.

(May, 1997, 12 marks)

Answer

Creditors A/c

Dr.			*Cr.*
	Rs.		*Rs.*
To Cash & Bank (I)	89,200	By Balance b/d	16,400
To Balance c/d	19,200	By Purchases	92,000
		(Balancing figure)	
	1,08,400		1,08,400

Work-in-progress A/c

Dr.			*Cr.*
	Rs.		*Rs.*
To Balance b/d	9,200	By Finished stock	1,51,000
To Raw-materials	53,000	By Balance c/d	
(Balancing figure)		Material (2): Rs.5,000	
To Wages (3)	70,000	Labour (2): Rs. 3,000	9,200
(7,000 hrs. x Rs. 10)		(300 hrs. x 4 hrs)	
To Overheads (4)	28,000	Overheads (2)	1,200
(7,000 hrs. x Rs.4)		(300 hrs. x Rs.4)	
	1,60,200		1,60,200

Raw-materials A/c

Dr.			*Cr.*
	Rs.		*Rs.*
To Balance b/d	32,000	By Work-in-progress	53,000
To Purchase	92,000	*(As above)*	
(As above)	_____	By Balance c/d	71,000
	1,24,000		1,24,000

Finished Goods A/c

Dr.			*Cr.*
	Rs.		*Rs.*
To Balance b/d	24,000	By Cost of sales	1,45,000
		(Balancing figure)	
To W.I.P.	1,51,000	By Balance c/d	30,000
(As above)	_____		_____
	1,75,000		1,75,000

Manufacturing Overheads A/c

Dr.			*Cr.*
	Rs.		*Rs.*
To Sundries	29,600	By W.I.P.	28,000
		(7000 x Rs.4)	
		By Under-absorbed	
	_____	Overheads A/c	1,600
	29,600		29,600

Question 18

BPR Limited keeps books on integrated accounting system. The following balances appear in the books as on April 1,2002.

	Dr. (Rs.)	*Cr. (Rs.)*
Stores Control A/c	*40,950*	–
Work-in-progress A/c	*38,675*	–
Finished Goods A/c	*52,325*	–
Bank A/c	–	*22,750*
Creditors A/c		*18,200*
Fixed Assets A/c	*1,47,875*	–
Debtors A/c	*27,300*	–
Share Capital A/c	–	*1,82,000*

Provision for Depreciation A/c	*–*	*11,375*
Provision for Doubtful Debts A/c	*–*	*3,725*
Factory Overheads Outstanding A/c	*–*	*6,250*
Pre-Paid Administration Overheads A/c	*9,975*	*–*
Profit & Loss A/c	*–*	*72,800*
	3,17,100	*3,17,100*

The transactions for the year ended March 31,2003, were as given below:

	Rs.	*Rs.*
Direct Wages	*1,97,925*	*--*
Indirect Wages	*11,375*	*2,09,300*
Purchase of materials (on credit)		*2,27,500*
Materials issued to production		*2,50,250*
Material issued for repairs		*4,550*
Goods finished during the year (at cost)		*4,89,125*
Credit Sales		*6,82,500*
Cost of Goods sold		*5,00,500*
Production overheads absorbed		*1,09,200*
Production overheads paid during the year		*91,000*
Production overheads outstanding at the end of year		*7,775*
Administration overheads paid during the year		*27,300*
Selling overheads incurred		*31,850*
Payment to Creditors		*2,29,775*
Payment received from Debtors		*6,59,750*
Depreciation of Machinery		*14,789*
Administration overheads outstanding at the end of year		*2,225*
Provision for doubtful debts at the end of the year		*4,590*

Required:

Write up accounts in the integrated ledger of BPR Limited and prepare a Trial balance.

(Nov, 2003, 10 marks)

Answer

Stores Control A/c

Dr.			*Cr.*
	Rs.		*Rs.*
To Balance b/d	40,950	By WIP A/c	2,50,250
To Creditors A/c	2,27,500	By Production overheads A/c	4,550
		By Balance c/d	13,650
	2,68,450		2,68,450

Wages Control A/c

Dr.			*Cr.*
	Rs.		*Rs.*
To Bank	1,97,925	By Work-in-Progress A/c	1,97,925
To Bank	11,375	By Production overheads A/c	11,375
	2,09,300		2,09,300

Work-in-Progress A/c

Dr.			*Cr.*
	Rs.		*Rs.*
To Balance b/d	38,675	By Finish goods A/c	4,89,125
To Wages control A/c	1,97,925	By Balance c/d	1,06,925
To Stores control A/c	2,50,250		
To Production overheads A/c	1,09,200		
	5,96,050		5,96,050

Production Overheads A/c

Dr.			*Cr.*
	Rs.		*Rs.*
To Wages control A/c	11,375	By WIP A/c	1,09,200
To Stores control A/c	4,550	By Profit & Loss A/c	14,039
To Bank (91,000 – 6,250)	84,750	(Under-absorbed overheads Written off)	
To Production overheads outstanding	7,775		
To Provision for depreciation	14,789		
	1,23,239		1,23,239

Finished goods A/c

Dr.			*Cr.*
	Rs.		*Rs.*
To Balance b/d	52,325	By Cost of sales A/c	5,00,500
To Work-in-progress A/c	4,89,125	By Balance c/d	80,450
To Admn. Overheads A/c	39,500		
	5,80,950		5,80,950

Administration overheads A/c

Dr.			*Cr.*
	Rs.		*Rs.*
To Pre-paid admn. Overheads A/c	9,975	By Finished goods A/c	39,500
To Bank	27,300		
To Admn. Ovherheads outstanding	2,225		
	39,500		39,500

Cost of Sales A/c

Dr.			*Cr.*
	Rs.		*Rs.*
To Finished goods A/c	5,00,500	To Sales A/c	5,32,350
To Selling overheads	31,850		
	5,32,350		5,32,350

Sales A/c

Dr.			*Cr.*
	Rs.		*Rs.*
To Cost of sales A/c	5,32,350	By Debtors A/c	6,82,500
To Profit & Loss A/c	1,50,150		
	6,82,500		6,82,500

Factory overheads / Production Overheads Outstanding A/c

Dr.			*Cr.*
	Rs.		*Rs.*
To Bank	6,250	By Balance b/d	6,250
To Balance c/d	7,775	By Production overheads	7,775
	14,025		14,025

Prepaid Administration overheads A/c

Dr.			*Cr.*
	Rs.		*Rs.*
To Balance b/d	9,975	By Admn. Overheads A/c	9,975
	9,975		9,975

Provision for depreciation A/c

Dr.			*Cr.*
	Rs.		*Rs.*
To Balance c/d	26,164	By Balance b/d	11,375
		By Production overheads A/c	14,789
	26,164		26,164

Provision for doubtful debts A/c

Dr.			*Cr.*
	Rs.		*Rs.*
To Balance c/d	4,590	By Balance b/d	3,725
		By Profit & Loss A/c	865
	4,590		4,590

Profit & Loss A/c

Dr.			*Cr.*
	Rs.		*Rs.*
To Provision for doubtful debts	865	By Balance b/d	72,800
To Production overheads	14,039	By Sales A/c	1,50,150
To Balance c/d	2,08,046		
	2,22,950		2,22,950

Debtors A/c

Dr.			*Cr.*
	Rs.		*Rs.*
To Balance b/d	27,300	By Bank A/c	6,59,750
To Sales A/c	6,82,500	By Balance c/d	50,050
	7,09,800		7,09,800

Creditors A/c

Dr.			*Cr.*
	Rs.		*Rs.*
To Bank	2,29,775	By Balance b/d	18,200
To Balance c/d	15,925	By Stores control/Ac	2,27,500
	2,45,700		2,45,700

Fixed Assets A/c

Dr.			*Cr.*
	Rs.		*Rs.*
	1,47,875	By balance c/d	1,47,875

Bank A/c

Dr.			*Cr.*
	Rs.		*Rs.*
To Debtors	6,59,750	By Balance b/d	22,750
		By Direct wages	1,97,925
		By Indirect wages	11,375
		By Production overheads (Rs. 84,750 + Rs.6,250)	91,000
		By Admn. Overheads A/c	27,300
		By Selling overheads A/c	31,850
		By Creditors A/c	2,29,775
	_____	By Balance c/d	47,775
	6,59,750		6,59,750

Trial Balance
As on March 31, 2003

	Dr.	*Cr.*
	Rs.	*Rs.*
Stores control A/c	13,650	
Work in Progress A/c	1,06,925	
Finished goods A/c	80,450	
Bank A/c	47,775	
Creditors A/c		15,925
Fixed Assets A/c	1,47,875	
Debtors A/c	50,050	
Share capital A/c		1,82,000
Provision for depreciation A/c		26,164
Profit & Loss A/c		2,08,046
Production overheads outstanding A/c		7,775
Outstanding administrative overheads A/c		2,225
Provision for doubtful debt	_____	4,590
	4,46,725	4,46,725

Question 19

In the absence of the Chief Accountant, you have been asked to prepare a months cost accounts for a company which operates a batch costing system fully integrated with the financial accounts. The following relevant information is provided to you.

	Rs.	Rs.
Balances at the beginning of the month:		
Stores Ledger control account		*25,000*
Work in progress control account		*20,000*
Finished goods control account		*35,000*
Prepaid Production overheads brought forward from previous month		*3,000*
Transactions during the month:		
Materials purchased		*75,000*
Material issued		
To Production	*30,000*	
To Factory Maintenance	*4,000*	*34,000*
Materials transferred between batches		
Total wages paid:		
To Direct workers	*25,000*	
To Indirect workers	*5,000*	*30,000*
Direct wages charged to batches		*20,000*
Recorded non-productive time of direct workers		*5,000*
Selling and distribution overheads incurred		*6,000*
Other Production Overheads Incurred		*12,000*
Sales		*1,00,000*
Cost of Finished Goods Sold		*80,000*
Cost of Goods completed and transferred into finished goods during the month		*65,000*
Physical value of work in progress at the end of the month		*40,000*

The production overhead absorption rate is 150% of direct wages charged to work in progress

Required:

Prepare the following accounts for the month:

(a) Stores Ledger Control Account.

(b) Work in Progress Control Account.

(c) Finished Goods Control Account.

(d) Production Overhead Control Account.

(e) Profit and Loss Account.

Answer

(a) Stores Ledger Control Account

	Rs.		Rs.
To Balance b/d	25,000	By Work in progress	
To Creditors (or bank)	75,000	Control A/c	30,000
		By Production Overhead	
		Control A/c	4,000
		By Balance c/d	66,000
	1,00,000		1,00,000

(b) Work-in Progress Control Account

	Rs.		Rs.
To Balance b/d	20,000	By Finished Goods	65,000
To Store Ledger Control A/c	30,000	Control A/c	
To Wages Control A/c	20,000	By Balance c/d	40,000
To Production Overhead		*(Physical value)*	
Control A/c	30,000		
(150% of direct wages)			
To Profit & Loss A/c	5,000		
(Stock Gains)			
	1,05,000		1,05,000

(c) Finished Goods Control Account

	Rs.		Rs.
To Balance b/d	35,000	By Cost of Goods A/c	80,000
To Work in progress Control A/c	65,000	or	
		By Profit & Loss A/c	
		By Balance c/d	20,000
	1,00,000		1,00,000

(d) Production Overhead Control Account

	Rs.		Rs.
To Balance b/d (Prepaid amount)	3,000	By Work-in-Progress	
To Stores Ledger Control A/c	4,000	Control A/c	30,000
To Wages Control A/c		*(150% of direct wages)*	
Direct Workers 5,000			
Indirect Workers 5,000	10,000		
To Bank	12,000		
To Profit & Loss A/c	1,000		
(Over absorption, balancing figure)			
	30,000		30,000

* Alternatively the over absorbed overhead may be carried forward.

(e) Profit & Loss Account

	Rs.		*Rs.*
To Finished goods Control A/c or Cost of goods sold A/c	80,000	By Sales A/c	1,00,000
		By Production Overhead Control A/c	1,000
To Selling & Distribution Overheads A/c	6,000	By Work-in-progress Control A/c (Stock gain)	5,000
To Balance c/d	20,000		
	1,06,000		1,06,000

Notes

(1) Materials transferred between batches will not affect the Control Accounts.

(2) Non-production time of direct workers is a production overhead and therefore will not be charged to work in progress control A/c.

(3) Production overheads absorbed in Work in Progress Control A/c will then equal Rs. 30,000 (150% of Rs. 20,000).

(4) In the Work in Progress Control A/c the excess physical value of stock is taken resulting in stock gain. Stock gain is transferred to Profit & Loss A/c.

Question 20

On 31st March, 1989 the following balances were extracted from the books of the Supreme Manufacturing Company.

	Dr.	*Cr.*
	Rs.	*Rs.*
Stores Ledger Control A/c	*35,000*	
Work in Progress Control A/c	*38,000*	
Finished Goods Control A/c	*25,000*	
Cost Ledger Control A/c		*98,000*
	98,000	*98,000*

The following transactions took place in April 1989

	Rs.
Raw Materials	
Purchased	*95,000*
Returned to suppliers	*3,000*
Issued to production	*98,000*
Returned to stores	*3,000*
Productive wages	*40,000*

Indirect labour	*25,000*
Factory overhead expenses incurred	*50,000*
Selling and Administrative expenses	*40,000*
Cost of finished goods transferred to warehouse	*2,13,000*
Cost of Goods sold	*2,10,000*
Sales	*3,00,000*

Factory overheads are applied to production at 150% of direct wages, any under/over absorbed overhead being carried forward for adjustment in the subsequent months. All administrative and selling expenses are treated as period costs and charged off to the Profit and Loss Account of the month in which they are incurred.

Show the following Accounts:

(a) Cost Ledger Control A/c
(b) Stores Ledger Control A/c
(c) Work in Progress Control A/c
(d) Finished goods stock control A/c
(e) Factory overhead control A/c
(f) Costing Profit and Loss A/c
(g) Trial Balance as at 30th April, 1989

Answer

(a) Cost Ledger Control A/c

Dr.			*Cr.*
	Rs.		*Rs.*
To Costing Profit & Loss A/c (Sales)	3,00,000	By Balance b/d	98,000
		By Stores Ledger Control A/c	95,000
To Stores Ledger Control A/c	3,000	By Wage Control A/c (Productive wages + Indirect wages)	65,000
To Balance c/d	95,000	By Factory Overhead Control A/c	50,000
		By Selling & Admn. Overhead Expenses	40,000
		By Costing, Profit & Loss A/c	50,000
	3,98,000		3,98,000

(b) Stores Ledger Control A/c

Dr.			*Cr.*
	Rs.		*Rs.*
To Balance b/d	35,000	By Cost Ledger Control A/c	3,000
To Cost Ledger Control A/c	95,000	By Work in Progress Control A/c	98,000
To Work in Progress Control A/c	3,000	By Balance c/d	32,000
	1,33,000		1,33,000

(c) Work-in-Progress Control A/c

Dr.			*Cr.*
	Rs.		*Rs.*
To Balance b/d	38,000	By Stores Ledger Control A/c	3,000
To Stores Ledger Control A/c	98,000	By Finished Goods A/c	2,13,000
To Wages Control A/c	40,000	By Balance c/d	20,000
To Factory Overhead Control A/c	60,000		
	2,36,000		2,36,000

(d) Finished Goods Control A/c

Dr.			*Cr.*
	Rs.		*Rs.*
To Balance b/d	25,000	By Cost of goods sold A/c	2,10,000
To Work in Progress Control A/c	2,13,000	By Balance c/d	28,000
	2,38,000		2,38,000

(e) Factory Overhead Control A/c

Dr.			*Cr.*
	Rs.		*Rs.*
To Wage Control A/c	25,000	By Work in progress Control A/c	60,000
(Interest Labour)		By Balance c/d	15,000
To Cost Ledger Control A/c	50,000		
	75,000		75,000

(f) Costing Profit and Loss A/c

Dr.			*Cr.*
	Rs.		*Rs.*
To Cost of goods sold A/c	2,10,000	By Cost Ledger Control A/c	3,00,000
To Selling and Admn. Overhead A/c	40,000	*(Sales)*	
To Cost Ledger Control A/c *(Costing profit)*	50,000		
	3,00,000		3,00,000

(g) Trial Balance (as at 30th April, 1989)

	Dr.	*Cr.*
	Rs.	*Rs.*
To Stores Ledger Control A/c	32,000	
To Work-in-Progress Control A/c	20,000	
To Finished Goods Control A/c	28,000	
To Factory Overhead Control A/c	15,000	
To Cost Ledger Control A/c		95,000
	95,000	95,000

Working Notes :

(1) **Wage Control A/c**

Dr.			*Cr.*
	Rs.		*Rs.*
To Cost Ledger Control A/c	65,000	By Work-in-Progress Control A/c	40,000
		By Factory overhead Control A/c	25,000
	65,000		65,000

(2) **Selling & Administration Expenses A/c**

Dr.			*Cr.*
	Rs.		*Rs.*
To Cost Ledger Control A/c	40,000	By Costing Profit & Loss A/c	40,000
	40,000		40,000

(3) **Cost of Goods Sold A/c**

Dr.			*Cr.*
	Rs.		*Rs.*
To Finished Goods Control A/c	2,10,000	By Costing Profit & Loss A/c	2,10,000
	2,10,000		2,10,000

Question 21

Dutta Enterprises operates an integral system of accounting. You are required to pass the Journal Entries for the following transactions that took place for the year ended 30-6-1990. (Narrations are not required)

	Rs.
Raw Materials Purchased (50% on Credit)	*6,00,000*
Materials Issued to Production	*4,00,000*
Wages Paid (50% Direct)	*2,00,000*
Wages Charged to Production	*1,00,000*
Factory Overheads Incurred	*80,000*
Factory Overheads Charged to Production	*1,00,000*
Selling and Distribution overheads Incurred	*40,000*
Finished Goods at Cost	*5,00,000*
Sales (50% Credit)	*7,50,000*
Closing Stock	*Nil*
Receipts from Debtors	*2,00,000*
Payments to Creditors	*2,00,000*

Answer

Journal Entries under Integral system of accounting for transactions taking place for the year ended on 30-6-1990

		Dr. Rs.	*Dr.* Rs.
Stores Ledger Account	Dr.	6,00,000	
To Sunday Creditors Account			3,30,000
To Cash or Bank Account			3,00,000
Work-in-Progress Control Account	Dr.	4,00,000	
To Stores Ledger Control Account			4,00,000
Wages Control Account	Dr.	2,00,000	
To Cash or Bank Account			2,00,000
Selling and Distribution Overheads Control Account	Dr.	40,000	
To Cash or Bank Account			40,000

Finished Stock Ledger Control Account	Dr.	5,00,000	
To Work-in-Progress Control Account			5,00,000
Cost of Sales Account	Dr.	5,40,000	
To Finished Stock Ledger Control Account			5,00,000
To Selling and Distribution Overheads Control Account			40,000
Sundry Debtors Account	Dr.	3,75,000	
Cash or Bank Account	Dr.	3,75,000	
To Sales Account			7,50,000
Cash or Bank Account	Dr.	2,00,000	
To Sundry Debtors Account			2,00,000
Sundry Creditors Account	Dr.	2,00,000	
To Cash or Bank Account			2,00,000
Work-in-Progress Control Account	Dr.	1,00,000	
To Wages Control Account			1,00,000
Factory Overheads Control Account	Dr.	1,00,000	
To Wages Control Account			1,00,000
Factory Overheads Control Account	Dr.	80,000	
To Cash or Bank Account			80,000
Work-in-Progress Control Account	Dr.	1,00,000	
To Factory Overheads Control Account			1,00,000

Question 22

The following balances were extracted from a company's ledger as on 31st December 1997.

	Rs.	*Rs.*
Raw materials control A/c	*48,836*	
Work-in-progress control A/c	*14,745*	
Finished stock control A/c	*21,980*	
Normal ledger control A/c	_____	*85,561*
	85,561	*85,561*

Further transaction took place during the following quarter as follows:

	Rs.
Factory overhead – allocated to WIP	*11,786*
Goods Finished – at cost	*36,834*
Raw materials purchased	*22,422*
Direct wages - allocated to WIP	*18,370*
Cost of goods sold	*42,000*
Raw materials – issued to production	*17,000*
Raw materials – credited by suppliers	*1,000*
Inventory audit – raw material losses	*1,300*
WIP rejected (with no scrap value)	*1,800*
Customer's returns (at cost) of finished goods	*3,000*

Prepare all the Ledger Accounts in Cost Ledger, *(Nov, 1998, 8 marks)*

Answer

Raw materials control A/c

Dr.			*Cr.*
Particulars	*Amount*	*Particulars*	*Amount*
	Rs.		*Rs.*
To Balance b/d	48,836	By W.I.P. control A/c	17,000
To Normal ledger control A/c	22,422	By Normal ledger control A/c	1,000
		By Normal ledger control A/c	1,300
	_____	By Balance c/d	51,958
	71,258		71,258
To Balance b/d	51,958		

Work-in-progress control A/c

Dr.			*Cr.*
Particulars	*Amount*	*Particulars*	*Amount*
			Rs.
To Balance b/d	14,745	By Finished stock control A/c	36,834
To Nominal ledger control A/c	11,786	By Nominal ledger control A/c	1,800
To Raw material control A/c	17,000	By Balance c/d	23,267
To Normal ledger control A/c	18,370		_____
	61,901		61,901
To Balance b/d	23,267		

Finished stock control A/c

Dr.			*Cr.*
Particulars	*Amount*	*Particulars*	*Amount*
	Rs.		*Rs.*
To Balance b/d	21,980	By Nominal ledger control A/c	42,000
To W.I.P. Control A/c	36,834	By Balance c/d	19,814
To Nominal ledger control A/c	3,000		
	61,814		61,814
To Balance b/d	19,814		

Nominal ledger control a/c

Dr.			*Cr.*
Particulars	*Amount*	*Particulars*	*Amount*
	Rs.		*Rs.*
To Raw material control A/c	1,000	By Balance b/d	85,561
To Raw material control A/c	1,300	By Raw material control A/c	22,422
To Finished stock control A/c	42,000	By W.I.P. control A/c	11,786
To W.I.P. control A/c	1,800	By W.I.P control A/c	18,370
To Balance c/d	95,039	By Finished stock control A/c	3,000
	1,41,139		1,41,139
		By Balance c/d	95,039

Question 23

The following figures are extracted from the Financial Accounts of Sellwel Ltd. For the year ended 31-12-1984:

	Rs.	*Rs.*
Sales (20,000 units)		*50,00,000*
Materials		*20,00,000*
Wages		*10,00,000*
Factory Overheads		*9,00,000*
Administrative Overheads		*5,20,000*
Selling and Distribution Overheads		*3,60,000*
Finished Goods (1,230 units)		*3,00,000*
Work-in-progress:		

Materials	*60,000*	
Labour	*40,000*	
Factory Overheads	*40,000*	
		1,40,000
Goodwill Written off		*4,00,000*
Interest paid on capital		*40,000*

In the costing records, Factory Overhead is charged at 100% of Wages, Administration Overhead 10% factory cost and Selling and Distribution Overhead at the rate of Rs. 20 per unit sold.

Prepare a statement reconciling the profit as per Cost Records with the profit as per Financial Records.

Answer

Sellwel Ltd.
Profit & Loss Account
(For the year ended 31st December, 1984)

Dr.			*Cr.*
To Opening Stock	Nil	By Sales (20,000 units)	50,00,000
To Materials	20,000	By Closing Stock (1,230 units)	3,00,000
To Wages	10,00,000	By Work-in-progress	1,40,000
To Factory Overheads	9,00,000		
To Administrative Overheads	5,20,000		
To Selling & Distribution Overheads	3,60,000		
To Goodwill written off	4,00,000		
To Interest on Capital	40,000		
To Net Profit	2,20,000		
	54,40,000		54,40,000

Cost Profit & Loss Statement
(For the year ended 31st December, 1984)

	Rs.
Materials	20,00,000
Wages	10,00,000
Prince Cost	30,00,000

Add: Factory Overhead @ 100% of wages	10,00,000
	40,00,000
Less: Closing Work-in-progress	1,40,000
Factory Cost (20,000 + 1,230) units	38,60,000
Administrative Overheads @ 10% of Factory Cost	3,86,000
	42,46,000
Less: Closing Stock of Finished Goods	2,46,000
1,230 units *(See Note)*	
Cost of Production (20,000 units)	40,00,000
Selling & Distribution Overhead @ Rs. 20 per unit	4,00,000
Cost of Sales (20,000 units)	44,00,000
Sales Revenue (20,000 units)	50,00,000
Profit	6,00,000

Note: Cost of 21,230 units is Rs. 42,46,000. Therefore, the cost of one unit is Rs. 200. Hence the cost of 1,230 units is Rs. 2,46,000.

Alternatively : Administrative overheads could be excluded from the cost of production.

Reconciliation Statement

	Rs.	*Rs.*
Profit as per Cost Records		6,00,000
Add: Factory Overheads over-absorbed		
(Rs. 10,00,000 – Rs. 9,00,000)	1,00,000	
Selling & Distribution Overhead Over-absorbed	–	
(Rs. 4,00,000 – Rs. 3,60,000)	40,000	
Difference in the valuation of closing stock of finished goods		
(Rs. 3,00,000 – Rs. 2,46,000)	54,000	1,94,000
		7,94,000
Less: Administrative Overhead Underabsorbed		
(Rs. 5,20,000 – Rs. 3,86,000)	1,34,000	
Goodwill written off relates to		
Financial Accounts	4,00,000	
Interest on Capital	40,000	5,74,000
Profit as per Financial Accounts		2,20,000

Question 24

The financial records of Modern Manufacturers Ltd. reveal the following for the year ended 30-6-1986:

		Rs. in thousands
		Rs.
Sales (20,000 units)		*4,000*
Materials		*1,600*
Wages		*800*
Factory Overheads		*720*
Office and Administrative Overheads		*416*
Selling and Distribution Overheads		*288*
Finished Goods (1,230 units)		*240*
Work-in-progress	*48*	
Labour	*32*	
Overheads (Factory)	*32*	*112*
Goodwill written off		*320*
Interest on Capital		*32*

In the Costing records, factory overhead is charged at 100% wages, administration overhead 10% of factory cost and selling and distribution overhead at the rate of Rs. 16 per unit sold.

Prepare a statement reconciling the profit as per cost records with the profit as per financial records of the company.

Answer

Profit & Loss Account of Modern Manufacturers
for the year ended 30-6-1986

			(Rs. in thousands)
To Materials	1,600	By Sales (20,000 units)	4,000
To Wages	800	By Closing Stock	
To Factory Overheads	720	By Finished Goods	240
To Office and Admn. Overheads	416	1230 units	
To Selling & Distribution Overheads	288	Work-in-Progress	112
To Goodwill written off	320		
To Interest on Capital	32		
To Net Profit	176		
	4,325		4,352

Profit as per Cost Record

	Rs. In thousands)
Materials	1,600
Wages	800
Prime Cost	2,400
Factory Overhead *(100% of wages)*	800
Gross Factory Cost	3,200
Less: Closing WIP	112
Factory Cost (21,230 units)	3,088
Add: Office & Administrative Overhead *(10% of Factory Cost)*	308.80
Total Cost of output	3,396.80
Less: Closing stock (1,230 units) of Finished Goods *(See Working Note 1)*	196.80
Cost of Production of 20,000 units	3,200.00
Selling and Distribution overhead (@ Rs. 16 p u.)	320.00
Cost of sales (20,000 units)	3,520.00
Sales Revenue (20,000 units)	4,000.00
Profit	480.00

Reconciliation Statement

	Rs. (,000)	*Rs. (,000)*
Profit as per Cost Accounts		480
Add: Factory overhead Overabsorbed (800-720)	80	
Selling and Distribution Overhead Overabsorbed (320-288)	32	
Closing stock overvalued in Financial Accounts (240-196.8)	43.20	152.2
		635.20
Less: Office & Administrative Overhead underabsorbed (416-308.80)	107.20	
Goodwill written off	320.00	
Interest on Capital	32.00	459.20
Profit as per Financial Accounts		176.00

Working Note:

1. Cost per unit of finished good = Total Cost of output / Total number of units produced
   = Rs. 3396.80 Thousand / 21,230 units = Rs. 160

   Cost of 1230 units = Rs. 160 x 1230 = Rs. 1,96,800

Alternatively: Administrative overheads could be excluded from the cost of production.

Question 25

Given below is the Trading and Profit and Loss Account of a Company for the year ended 31st March, 1993:

	Rs.			Rs.
To Materials	*27,40,000*	*By Sales*		*60,00,000*
To Wages	*15,10,000*	*(60,000 units)*		
To Factory Expenses	*8,30,000*	*By Stock (2,000 units)*		*1,60,000*
To Admn. Expenses	*3,82,400*	*By Work-in- Progress*	*Rs.*	
To Selling Expenses	*4,50,000*	*Materials*	*64,000*	
To Preliminary		*Wages*	*36,000*	
Expenses		*Factory Expenses*	*20,000*	*1,20,000*
Written off	*60,000*	*By Dividend received*		*18,000*
To Net Profit	*3,25,600*			
	62,98,000			*62,98,000*

The Company manufactures standard units. In the Cost Accounts:

(i) Factory expenses have been allocated to production at 20% of Prime Cost;

(ii) Administrative expenses at Rs. 6 per unit produced; and

(iii) Selling expenses at Rs. 8 per unit sold.

Prepare the Costing Profit and Loss Account of the company and reconcile the same with the profit disclosed by the Financial Accounts.

Answer

Costing Profit & Loss Account

	Rs.		Rs.
To Materials	26,76,000	By Sales	60,00,000
(Working Note 1)		By Closing Stock	1,72,646
To Wages	14,74,000	*(Working Note 4)*	
(Working Note 2)			
To Factory Expenses	8,30,000		
(20% of Prime cost viz Rs. 41,50,000)			

(Refer to Working Note 3)		
To Administration Expenses (@ Rs. 6 p.u. x 62,000 units)	3,72,000	
To Selling Expenses (@ Rs. 8 p.u. x 60,000 units)	4,80,000	
To Net Profit	3,40,646	
	61,72,646	61,72,646

Reconciliation Statement

	Rs.	*Rs.*
Profit as per Cost Accounts		3,40,646
Add: Dividends not included in Cost Accounts	18,000	
Factory Expenses overabsorbed in Cost Accounts (Rs. 8,30,000 Rs. 8,10,000)	20,000	
Selling overheads overabsorbed in Cost Accounts (Rs. 4,80,000 – Rs. 4,50,000)	30,000	68,000
		4,08,646
Less: Preliminary expenses not included in Cost Accounts	60,000	
Administrative expenses under absorbed in Cost Accounts (Rs. 3,82,400 – Rs. 372,000)	10,400	
Closing stock overvalued in Cost Accounts (Rs 1,72,646 – Rs. 1,60,000)	12,646	83,046
(Refer to Working Note 4)		
Profit as per Financial Accounts		3,25,600

Working Notes:

1. Material = Rs. 27,40,000 – Rs. 64,000 = 26,76,000
2. Wages = Rs. 15,10,000 – Rs. 36,000 = Rs. 14,74,000
3. Prime Cost = Materials+Wages = Rs. 26,76,000 + Rs.14,74,000= Rs. 41,50,000
4. Closing Stock Value $= \left(\frac{\text{Material Cost} + \text{Wages} + \text{Factory Expenses} + \text{Admn. Expenses}}{\text{62,000 units}}\right) \text{x } 2000$

$$= \frac{\text{Rs.}53,52,000}{62,000} \times 2,000 = \text{Rs. } 1,72,646$$

Question 26

M/s Sellwell Ltd. has furnished you the following information from the financial books for the year ended 31st December, 1993:

Profit & Loss Account
For the year ended 31st December, 1993

	Rs.		Rs.
Opening stock of finished goods:		*Sales 10,250 units*	*3,58,750*
500 units @ Rs. 17.50 each	*8,750*	*Closing stock of finished goods:*	
Materials consumed	*1,30,000*	*250 units @ Rs. 25 each*	*6,250*
Wages	*75,000*		
Gross Profit c/d	*1,51,250*		
	3,65,000		*3,65,000*
Factory overheads	*47,375*	*Gross Profit c/d*	*1,51,250*
Administration overheads	*53,000*	*Interest*	*125*
Selling expenses	*27,500*	*Rent received*	*5,000*
Bad Debts	*2,000*		
Preliminary expenses	*2,500*		
Net Profit	*24,000*		
	1,56,375		*1,56,375*

The cost sheet shows: (i) the cost of materials as Rs. 13 per unit; (ii) the labour cost as Rs. 7.50 per unit; (iii) the factory overheads are absorbed at 60% of labour cost; (iv) the administration overheads are absorbed at 20% of factory cost; (v) selling expenses are charged at Rs. 3 per unit; (vi) the opening stock of finished goods is valued at Rs. 22.50 per unit.

You are required to prepare:

(i) The cost sheet showing the number of units produced and the cost of production, by elements of costs, per unit and in total.

(ii) The statement of profit or loss as per cost accounts for the year ended 31st December, 1993.

(iii) *The statement showing the reconciliation of profit or loss as shown by the cost accounts with the profit as shown by the financial accounts.*

Answer

(i) Cost Sheet of M/s Sellwell Ltd. for 10,000 units*
(for the year ended 31st Dec., 1993)

	Cost per unit	Total Cost
	Rs.	Rs.
Material	13.00	1,30,000
Labour	7.50	75,000

Factory Overheads		
60% of Labour Cost	4.50	45,000
Factory Cost	25.00	2,50,000
Administrative Overheads		
20 % of Factory cost	5.00	50,000
Total Cost of Production	30.00	3,00,000

(ii) Statement of Profit or Loss as per Cost Accounts (for the year ended 31st Dec., 1993)

	No. of Units	*Amount (Rs.)*
Opening stock of finished goods; 500 x Rs. 22.50	500	11,250
Add: Cost of Production at Rs. 30 per unit	10,000	3,00,000
Total	10,500	3,11,250
Less: Closing stock of finished goods @ Rs.30 per unit	250	7,500
Cost of goods sold	10,250	3,03,750
Selling expenses @ Rs. 3 per unit	10,250	30,750
Cost of sales	10,250	3,34,500
Sales revenue	10,250	3,58,750
Profit		24,250

(iii) Statement showing the reconciliation of Profit or Loss as shown by Cost and Financial Account

	Rs.	*Rs.*
Profit as per Cost Accounts	--	24,250
Add: Selling expenses over-absorbed		
(Rs. 30,750 – Rs. 27,500)	3,250	
Overvaluation of opening stock in Cost Accounts		
(Rs. 11,250 – Rs. 8,750)	2,500	
Income excluded Cost Accounts:		
Interest	125	
Rent	5,000	10,875
		35,125
Less: Under recovery of overheads in Cost Accounts		
Factory overheads:		
(Rs. 47,375 – Rs. 45,000	2,375	
Administrative Overheads	3,000	

(Rs. 53,000 – Rs. 50,000)		
Over valuation of closing stock in Cost Accounts:		
(Rs. 7,500 – Rs. 6,250)	1,250	
Expenses excluded from Cost Accounts:		
Bad Debts	2,000	
Preliminary expenses	2,500	11,125
Profit as per financial accounts		24,000

Question 27

The Chief Cost Accountant of Omega Limited found to his surprise that the profit was the same as per cost accounts as well as the financial accounts. He asked his deputy to find out the reasons for the same. You are required to analyse and suggest a Reconciliation Statement is necessary or not.

Answer

Chief Cost Account of M/s Omega Ltd. noticed that the profit of the concern under Cost and Financial Accounting Systems was the same. This fact indicates that the concern was using a non-integrated accounting system. The figure of profit under Cost and Financial accounts will be the same when the amount of total under charges equal to the amount of total overcharges in each set of books.

The statement of profit under Cost Accounts is usually prepared on the basis of standard/budgeted figures in respect of various elements of cost, whereas it is prepared on actual basis under financial accounts.

Consider the following assumed statements of profit as per Cost and Financial Accounts of M/s Omega Ltd. to ascertain the reasons, which account for the figure of profit to be same under two sets of accounts.

Statement of Profit of M/s Omega Ltd. as per Cost A/c

	Rs.	*Rs.*
Direct Material:		2,75,000
(2,50,000 x Rs. 1.1)		
Direct wages		
2,50,000 x Rs. 0.75		1,87,500
Prime Cost		4,62,500
Add: Factory overheads:		
Variable:	60,000	
Fixed:	75,000	1,35,000
Factory Cost		5,97,500
Add: Office Overheads:		50,000
Cost of Production:		6,47,500

Add: Selling & Dist OV.		
Variable:	30,000	
Fixed:	63,500	93,500
Cost of Sales		7,41,000
Profit:		9,000
Sales:		7,50,000

Statement of Profit & Loss Account of M/s Omega Ltd.

	Rs.		*Rs.*
To Direct Materials	3,00,000	By Sales	7,50,000
To Direct Wages	2,00,000	(2,50,000 units)	
To Factory expenses	1,20,000		
To Office express	40,000		
To Selling & Dist. Expenses	80,000		
To Legal expenses	1,000		
To Net profit	9,000		
	7,50,000		7,50,000

An analysis of Cost and Financial profit statement indicates the following facts:

(1) The profit of the concern under two sets of accounts is the same i.e. Rs. 9,000.

(2) A sum of Rs. 25,000 is under charged in Cost Accounts on account of direct material cost. The estimated cost on this account was Rs. 2,75,000 whereas actual cost incurred amounted to Rs. 3,00,000.

(3) Similarly, a sum of Rs. 12,500 is under charged in Cost Accounts on account of direct wages. Estimated costs were Rs. 1,87,500 whereas actual costs comes to Rs. 2,00,000.

(4) A sum of Rs. 1,000 towards legal expenses is only charged in financial accounts and was not shown in Cost Accounts.

(5) A sum of Rs. 15,000 difference between budgeted and actual factory overheads is over-charged in Cost Accounts.

(6) A sum of Rs. 10,000 difference between budgeted and actual office overheads is overcharged in Cost Accounts.

(7) A sum of Rs. 13,500 difference between budgeted and actual selling and distribution overheads is overcharged in Cost Accounts.

Thus, the total amount of under charges is equal to total amount of over charges in each set of books and it is equal to Rs. 38,500. As a result, the profit was the same as per cost accounts as well as the financial accounts. The above analysis also indicates that though the figure of profit under two sets of accounts is same but the figures of material, labour and overhead costs differ. It also points out items, which are present in financial accounts and not in cost accounts.

The statement of reconciliation is necessary, as the two sets of accounts are non-integrated. It is only the reconciliation statement which would indicate the amount of under charges and over-charges for different elements of cost. The knowledge of under charges and over-charges would enable the management to initiate necessary action for control purposes. For example, in the case of M/s Omega Ltd., the sum of Rs. 25,000 more has been spent on the materials for the manufacturing of 2,50,000 units of the product. This is known as material cost variance. This variance may arise either due to excess material usage or price Information about the occurrence of variances is provided by a statement of reconciliation to the accountants, so that necessary control action may be taken. Such a statement also includes the items which have not been included in Cost Accounts but are present in Financial Accounts.

Question 28

The following figures have been extracted from the Financial Accounts of a Manufacturing Firm for the first year of its operation:

	Rs.
Direct Material Consumption	*50,00,000*
Direct Wages	*30,00,000*
Factory Overheads	*16,00,000*
Administrative Overheads	*7,00,000*
Selling and Distribution Overheads	*9,60,000*
Bad Debts	*80,000*
Preliminary Expenses written off	*40,000*
Legal Charges	*10,000*
Dividends Received	*1,00,000*
Interest Received on Deposits	*20,000*
Sales (1,20,000 units)	*1,20,00,000*
Closing Stocks:	
Finished Goods (4,000 units)	*3,20,000*
Work in Progress	*2,40,000*

The cost accounts for the same period reveal that the direct material consumption was Rs. 56,00,000. Factory overhead is recovered at 20% on prime cost. Administration overhead is recovered at Rs. 6 per unit of production. Selling and distribution overheads are recovered at Rs. 8 per unit sold.

Prepare the Profit and Loss Accounts both as per financial records and as per cost records. Reconcile the profits as per the two records.

Answer

Profit and Loss Account
(As per financial records)

	Rs.		*Rs.*
To Direct Material	50,00,000	By Sales	1,20,00,000
To Direct Wages	30,00,000	(1,20,000 units)	
To Factory Overheads	16,00,000	By Closing Stock	
To Gross Profit	29,60,000	WIP	2,40,000
		Finished Goods	3,20,000
		(4,000 units)	
	1,25,60,000		1,25,60,000
To Administration Overheads	7,00,000	By Gross Profit b/d	29,60,000
To Selling and Distribution	9,60,000	By Dividend	1,00,000
Overheads		By Interest	20,000
To Bad Debts	80,000		
To Preliminary Expenses	40,000		
written off			
To Legal Charges	10,000		
To Net Profit	12,90,000		
	30,80,000		30,80,000

Statement of Cost and Profit
(As per Cost Records)

	Total *Rs.*
Direct Material	56,00,000
Direct Wages	30,00,000
Prime Cost	86,00,000
Factory Overhead	17,20,000
	1,03,20,000
Less: Closing Stock (WIP)	2,40,000
Works Cost (1,24,000 units	1,00,80,000
Administration Overhead (1,24,000 units @ Rs. 6/- p.u.)	7,44,000
Cost of production of (1,24,000 units)	1,08,24,000
Less: Finished Goods (4,000 units @ Rs. 87.29)	3,49,160
Cost of goods sold (1,20,000 units)	1,04,74,840

Selling and Distribution Overhead (1,20,000 @ Rs. 8/- p.u.)	9,60,000
Cost of Sales	1,14,34,840
Net profit (Balancing figure)	5,65,160
Sales Revenue	1,20,00,000

Statement of Reconciliation of profit as obtained under Cost and Financial Accounts

	Rs.	*Rs.*
Profit as per Cost Records		5,65,160
Add: Excess of Material Consumption	6,00,000	
Excess Factory Overhead	1,20,000	
Excess Administration Overhead	44,000	
Dividend Received	1,00,000	
Interest Received	20,000	8,84,000
		14,49,160
Less: Bad debts	80,000	
Preliminary expenses written off	40,000	
Legal charges	10,000	
Over-valuation of Closing stock in cost books (Rs. 3,49,160 – Rs. 3,20,000)	29,160	1,59,160
Profit as per Financial Records		12,90,000

Question 29

The following information is available from the financial books of a company having a normal production capacity of 60,000 units for the year ended 31st March, 1995:

(i) Sales Rs. 10,00,000 (50,000 units).

(ii) There was no opening and closing stock of finished units.

(iii) Direct material and direct wages cost were Rs. 5,00,000 and Rs. 2,50,000 respectively.

(iv) Actual factory expenses were Rs. 1,50,000 of which 60% are fixed.

(v) Actual administrative expenses were Rs. 45,000 which are completely fixed.

(vi) Actual selling and distribution expenses were Rs. 30,000 of which 40% are fixed.

(vii) Interest and dividends received Rs. 15,000.

You are required to:

(a) Find out profit as per financial books for the year ended 31st March, 1995;

(b) *Prepare the cost sheet and ascertain the profit as per cost accounts for the year ended 31st March, 1995 assuming that the indirect expenses are absorbed on the basis of normal production capacity; and*

(c) *Prepare a statement reconciling profits shown by financial and cost books.*

(May, 1995, 16 marks)

Answer

Working Note:

Profit & Loss Account

(for the year ended 31st March, 1995)

	Rs.		*Rs*
To Direct Material	5,00,000	By Sales	10,00,000
To Direct Wages	2,50,000	50,000 units	
To Actual factory expenses	1,50,000	By Interest and	
To Actual administrative expenses	45,000	Dividends	15,000
To Actual selling and distribution expenses	30,000		
To Profit	40,000		
	10,15,000		10,15,000

(a) Profit as per financial books for the year ended 31st March, 1995 is Rs. 40,000 (Refer to working Note).

(b) Cost Sheet

(for the year ended 31st March, 1995)

	Rs.
Direct Material	5,00,000
Direct Wages	2,50,000
Prime Cost	7,50,000
Factory expenses:	
Variable : Rs. 60,000	
Fixed : $Rs.90,000 \times \frac{5}{6}$	1,35,000
Works Cost :	8,85,000
Administrative expenses : $Rs.45,000 \times \frac{5}{6}$	37,500

Cost of production	9,22,500
Selling & distribution expenses	
Variable : Rs. 18,000	
Fixed : $\text{Rs.}12{,}000 \times \frac{5}{6}$	28,000
Cost of Sales	9,50,500
Profit	49,500
Sales revenue	10,00,000

(c) Statement of Reconciliation
(Reconciling profit shown by Financial and Cost Accounts)

	Rs.	*Rs.*
Profit as per Cost Accounts	49,500	–
Add: Income from interest and dividends	15,000	
		64,500
Less: Factory expenses undercharged in Cost Accounts	15,000	
(Rs. 1,50,000 – Rs. 1,35,000)		
Administrative expenses undercharged in Cost Accounts	7,500	
(Rs. 45,000 – Rs. 37,500)		
Selling & distribution expenses under-charged in Cost Accounts	2,000	24,500
(Rs. 30,000 – Rs. 28,000)		
Profit is per Financial Accounts		40,000

Question 30

The financial books of a company reveal the following data for the year ended 31st March, 2002:

Opening Stock:	*Rs.*
Finished goods 875 units	*74,375*
Work-in-process	*32,000*
1.4.01 to 31.3.02	
Raw materials consumed	*7,80,000*
Direct Labour	*4,50,000*
Factory overheads	*3,00,000*

Goodwill	*1,00,000*
Administration overheads	*2,95,000*
Dividend paid	*85,000*
Bad Debts	*12,000*
Selling and Distribution Overheads	*61,000*
Interest received	*45,000*
Rent received	*18,000*
Sales 14,500 units	*20,80,000*
Closing Stock: Finished goods 375 units	*41,250*
Work-in-process	*38,667*

The cost records provide as under:

- *Factory overheads are absorbed at 60% of direct wages.*
- *Administration overheads are recovered at 20% of factory cost.*
- *Selling and distribution overheads are charged at Rs. 4 per unit sold.*
- *Opening Stock of finished goods is valued at Rs. 104 per unit.*
- *The company values work-in-process at factory cost for both Financial and Cost Profit Reporting.*

Required:

(j) Prepare statements for the year ended 31st March, 2002 show

- *the profit as per financial records*
- *the profit as per costing records.*

(ii) Present a statement reconciling the profit as per costing records with the profit as per Financial Records. *(May, 2002, 10 marks)*

Answer

(i) Statement of Profit as per financial records
OR
Profit & Loss Account of the company
(for the year ended March 31, 2002)

	Rs.		*Rs.*
To Opening stock of Finished goods	74.375	By Sales	20,80,000
To Work-in-process	32,000	By Closing stock of finished goods	41250

To Raw materials consumed	7,80,000	By Work-in-Process	38,667
To Direct labour	4,50,000	By Rent received	18,000
To Factory overheads	3,00,000	By Interest received	45,000
To Goodwill	1,00,000		
To Administration overheads	2,95,000		
To Selling & distribution overheads	61,000		
To Dividend paid	85,000		
To Bad debts	12,000		
To Profit	33,542		
	22,22,917		22,22,917

Statement of Profit as per costing records

(for the year ended March 31,2002)

	Rs.
Sales revenue (A)	20,80,000
(14,500 units)	
Cost of sales:	
Opening stock	91,000
(875 units x Rs. 104)	
Add: Cost of production of 14,000 units	17,92,000
(Refer to working note 2)	
Less: Closing stock	48,000
$\left(\frac{\text{Rs.}17,92,000 \times 375 \text{ units}}{14,000 \text{ units}}\right)$	
Production cost of goods sold (14,500 units)	18,35,000
Selling & distribution overheads	58,000
(14,500 units x Rs. 4)	
Cost of sales: (B)	18,93,000
Profit: {(A) – (B)}	1,87,000

(ii) Statement of Reconciliation

(Reconciling the profit as per costing records with the profit as per financial records)

	Rs.	*Rs.*
Profit as per Cost Accounts		1,87,000
Add: Administration overheads over absorbed (Rs. 2,98,667 – Rs. 2,95,000)	3,667	
Opening stock overvalued (Rs. 91,000 – Rs. 74,375)	16,625	
Interest received	45,000	
Rent received	18,000	83,292
		2,70,292
Less: Factory overheads under recovery (Rs. 3,00,000 – Rs. 2,70,000)	30,000	
Selling & distribution overheads under recovery (Rs. 61,000 – Rs. 58,000)	3,000	
Closing stock overvalued (Rs. 48,000 – Rs. 41,250)	6,750	
Goodwill	1,00,000	
Dividend	85,000	
Bad debts	12,000	2,36,750
Profit as per financial accounts		33,542

Working notes:

1. Number of units produced

	Units
Sales	14,500
Add: Closing stock	375
Total	14,875
Less: Opening stock	875
Number of units produced	14,000

2. Cost Sheet

	Rs.
Raw materials consumed	7,80,000
Direct labour	4,50,000
Prime cost	12,30,000
Factory overheads	2,70,000
(60% of direct wages)	
Factory cost	15,00,000
Add: Opening wori-in-process	32,000
Less: Closing work-in-process	38,667
Factory cost of goods produced	14,93,333
Administration overheads	2,98,667
(20% of factory cost)	
Cost of production of 14,000 units	17,92,000
(Refer to working note 1)	

Cost of production per unit:

$$= \frac{\text{Total Cost of Production}}{\text{No. of units produced}} = \frac{\text{Rs. } 17,92,000}{14,000 \text{ units}} = \text{Rs. } 128$$

Question 31

A manufacturing company disclosed a net loss of Rs. 3,47,000 as per their cost accounts for the year ended March 31,2003. The financial accounts however disclosed a net loss of Rs. 5,10,000 for the same period. The following information was revealed as a result of scrutiny of the figures of both the sets of accounts.'

	Rs.
(i) Factory Overheads under-absorbed	*40,000*
(ii) Administration Overheads over-absorbed	*60,000*
(iii) Depreciation charged in Financial Accounts	*3,25,000*
(iv) Depreciation charged in Cost Accounts	*2,75,000*
(v) Interest on investments not included in Cost Accounts	*96,000*
(vi) Income-tax provided	*54,000*

(vii) Interest on loan funds in Financial Accounts	*2,45,000*
(viii) Transfer fees (credit in financial books)	*24,000*
(ix) Stores adjustment (credit in financial books)	*14,000*
(x) Dividend received	*32,000*

Prepare a memorandum Reconciliation Account *(May, 2003, 8 marks)*

Answer

Memorandum Reconciliation Accounts

Dr.			*Cr.*
	Rs.		*Rs.*
To Net Loss as per Costing books	3,47,000	By Administration overheads over recovered in cost accounts	60,000
To Factory overheads under absorbed in Cost Accounts	40,000	By Interest on investment not included in Cost Accounts	96,000
To Depreciation under charged in Cost Accounts	50,000	By Transfer fees in Financial books	24,000
To Income-Tax not provided in Cost Accounts	54,000	By Stores adjustment (Credit in financial books)	14,000
To Interest on Loan Funds in Financial Accounts	2,45,000	By Dividend received in financial books	32,000
	_____	By Net loss as per Financial books	5,10,000
	7,36,000		7,36,000

Question 32

Write short note on Integrated Accounts *(May, 1995, 4 marks)*

Answer

Integrated Accounts: Integrated (or Integral) Accounts is the name given to a system whereby cost and financial accounts are kept in the same set of books. Obviously, there will be no separate sets of books for Costing and Financial purposes. Integrated Accounts will have to afford full information required for Costing as well as for Financial Accounts. In other words, information and data should be recorded in such a way as to enable the firm to ascertain the Cost (together with the necessary analysis) of each product job, process, operation or any other identifiable activity. For instance, purchases are analysed by nature of material and its end-use. Purchases account is eliminated and direct posting are made to

Stores Control Account, Work-in-Progress Account, or Overhead Account. Payroll is straightway analysed into direct labour and overheads. It also ensures the ascertainment of marginal cost, variances, abnormal losses and gains – in fact, all information that management requires from a system of Costing for doing its work properly. The integrated accounts give full information in such a manner so that the profit and loss account and the balance sheet can be prepared according to the requirements of law and management maintains full control over the liabilities and assets of its business.

The main advantages of Integrated Accounts are as follows:

1. Since there is one set of accounts, thus there is one figure of profit. Hence the question of reconciliation of costing profit and financial profit does not arise.
2. There is no duplication of recording of entries and efforts in the separate set of books.
3. Costing data are available from books of original entry and hence no delay is caused in obtaining information.
4. The operation of the system is facilitated with the use of mechanized accounting.
5. Centralisation of accounting function results in economy.

The essential pre-requisites for integrated accounts include the following steps.

1. The management's decision about the extent of integration of two sets of books. Some concerns find it useful to integrate upto the stage of primary cost or factory cost while others prefer full integration of the entire accounting records.
2. A suitable coding system must be made available so as to serve the accounting purposes of financial and cost accounts.
3. An agreed routine, with regard to the treatment of provision of accruals, prepaid expenses, and other adjustments necessary for preparation of interim accounts.
4. Perfect coordination should exist between the staff responsible for the financial and cost aspects of the accounts and an efficient processing of the accounting documents should be ensured.

Question 33

During the physical verification of stores of X Ltd. it was found that 100 units of raw material 'Wye' was returned to the supplier has not been recorded. Its purchase invoice price is Rs. 5 per unit while the current standard cost is Rs. 4.80 per unit. Pass necessary journal entry to record the adjustment in the cost ledger of X Ltd. (Nov., 1997,4 marks)

Answer

	Dr.	*Cr.*
	Rs.	*Rs.*
General ledger adjustment a/c	500	
To Stores ledger A/c		480
To Material purchase variance A/c		20

Question 34

The following figures have been extracted from the cost records of a manufacturing unit:

	Rs.
Stores: Opening balance	*32,000*
Purchases of material	*1,58,000*
Transfer from work-in-progress	*80,000*
Issues to work-in-progress	*1,60,000*
Issues to repair and maintenance	*20,000*
Deficiencies found in stock taking	*6,000*
Work-in-progress: Opening balance	*60,000*
Direct wages applied	*65,000*
Overheads applied	*2,40,000*
Closing balance of W.I.P.	*45,000*

Finish products: Entire output is sold at a profit of 10% on actual cost from work-in-progress. Wages incurred Rs. 70,000, overhead incurred Rs. 2,50,000.

Items not included in cost records: Income from investment Rs. 10,000, Loss on sale of capital assets Rs. 20,000.

Draw up Store Control account, Work-in-progress Control account, Costing Profit and Loss account, Profit and Loss account and Reconciliation statement.

Answer

(A) Costing books

Stores Control Account

Particulars	*Rs.*	*Particulars*	*Rs.*
To balance b/d	32,000	By W.I.P. Control A/c	1,60,000
To general ledger adjustment A/c	1,58,000	"Work overhead control a/c	20,000
To work in progress control A/c	80,000	"Costing Profit and Loss a/c	6,000
		"Balance c/d	84,000
	2,70,000		2,70,000

W.I.P. Control Account

Particulars	*Rs.*	*Particulars*	*Rs.*
To balance b/d	60,000	By stores control A/c	80,000
To stores control A/c	1,60,000	By costing profit and loss A/c	
To direct wages control A/c	65,000	(Cost of sales)	4,00,000
To works overhead control A/c	2,40,000	By balance c/d	45,000
	5,25,000		5,25,000

Works overhead control account

Particulars	*Rs.*	*Particulars*	*Rs.*
To general ledger adjustment A/c	2,50,000	By W.I.P. Control A/c	2,40,000
To store ledger control A/c	20,000	By costing profit & loss A/c (under recovery)	30,000
	2,70,000		2,70,000

Costing Profit & Loss Account

Particulars	*Rs.*	*Particulars*		*Rs.*
To W.I.P. control A/c (Cost of sales)	4,00,000	By general ledger adjustment A/c		
		Cost of sales	4,00,000	
		10% profit	40,000	4,40,000
To works overhead control A/c	30,000			
To stores control A/c (shortage)	6,000			
To profit	4,000			
	4,40,000			4,40,000

(B) Financial Books

Profit & Loss Account

Particulars		*Rs.*	*Particulars*		*Rs.*
To opening stock			By sales		4,40,000
Stores	32,000		By closing stock:		
W.I.P.	60,000	92,000	Stores	84,000	
			W.I.P.	45,000	1,29,000
To purchases		1,58,000	By income from investment		10,000
To wages incurred		70,000	By loss		11,000
To overheads incurred		2,50,000			
To loss on sale of capital assets		20,000			
		5,90,000			5,90,000

Reconciliation statement

		Rs.
Profit as per cost accounts		4,000
Add:		
Income from investment recorded in financial accounts		10,000
		14,000
Less:		
Under absorption of wages in cost accounts	5,000	
Loss on sales of capital asset only included in financial accounts	20,000	25,000
Loss as per financial accounts		11,000

Question 35

The following is the Trading and Profit & Loss Account of Omega Limited:

Dr.		*Cr.*	
Particulars	*Rs.*	*Particulars*	*Rs.*
To Materials consumed	*23,01,000*	*By Sales*	
To Direct wages	*12,05,750*	*(30,000 units)*	*48,75,000*
To Production Overheads	*6,92,250*	*By Finished goods*	
To Administration Overheads	*3,10,375*	*Stock (1,000 units)*	*1,30,000*

To Selling and Distribution Overheads	*3,68,875*	*By Work-in-progress:*		
To preliminary Expenses written off	*22,750*	*Materials*	*55,250*	
To Goodwill written off	*45,500*	*Wages*	*26,000*	
To Fines	*3,250*	*Production*		
To Interest on Mortgage	*13,000*	*Overheads*	*16,250*	*97,500*
To Loss on Sale of machine	*16,250*	*By Dividends received*		*3,90,000*
To Taxation	*1,95,000*			
To Net Profit for the year	*3,83,500*	*By Interest on bank deposits*		*65,000*
	55,57,500			*55,57,500*

Omega Limited manufactures a standard unit.

The Cost Accounting records of Omega Ltd. show the following:

(i) Production overheads have been charged to work-in-progress at 20% on Prime cost.

(ii) Administration Overheads have been recovered at Rs. 9.75 per finished Unit.

(iii) Selling & distribution Overheads have been recovered at Rs. 13 per Unit sold.

(iv) The Under- or Over-absorption of Overheads has not been transferred to costing P/L A/c.

Required:

(i) Prepare a proforma Costing Profit & Loss account, indicating net profit.

(ii) Prepare Control accounts for production overheads, administration Overheads and selling & distribution Overheads.

(iii) Prepare a statement reconciling the profit disclosed by the cost records with that shown in Financial accounts. (3+3+4 = 10 Marks)

Answer

(i) Costing Profit & Loss A/c

		Rs.
Materials		23,01,000
Wages		12,05,750
	Prime Cost	35,06,750
	Production overheads (20% of Prime Cost)	7,01,350
		42,08,100
Less:	Work in Progress	97,500
	Manufacturing cost incurred during the period	41,10,600
Add:	Admn. Ohs (9.75 x 31000)	3,02,250

	Cost of Production	44,12,850
Less	Cl. Finished goods stock($4412850 \times \frac{1000}{31000}$)	1,42,350
	COGS	42,70,500
Add	Selling & distribution OHs (30,000× Rs. 13)	3,90,000
	Cost of Sales	46,60,500
	Profit	2,14,500
	Sales	48,75,000

(ii) Production OH A/c

	Rs		*Rs*
To Gen ledger Adj. A/c	6,92,250	By WIP A/c	7,01,350
To Bal. C/d	9,100		
	7,01,350		7,01,350

Admn. OH A/c

	Rs		*Rs*
To Gen Ledger Adj. A/c	3,10,375	By Finished goods A/c	3,02,250
		By bal c/d	8,125
	3,10,375		3,10,375

Selling & Distribution OHs A/c

	Rs		*Rs*
To Gen. Ledger Adj A/c	3,68,875	By Cost of Sales A/c	3,90,000
To bal C/d	21,125		
	3,90,000		3,90,000

(iii) Reconciliation Statement

			Rs
	Profits as per cost accounts		2,14,500
Add:	Prodn. OHs over absorbed	9,100	
	Selling & distribution OHs (Over absorbed)	21,125	
	Dividend received	3,90,000	
	Interest on bank deposits	65,000	4,85,225
			6,99,725
Less:	Admn Ohs under-absorbed	8,125	
	Preliminary exp. w/off	22,750	
	Goodwill w/off	45,500	
	Fines	3,250	

Interest on Mortgage	13,000	
Loss on sale of machinery	16,250	
Taxation	1,95,000	
Write-down of Finished stock (1,42,350 – 130,000)	12,350	3,16,225
Profit as per Financial Accounts		3,83,500

Question 36

What is 'Integrated Accounting System'? State its advantages. (May 2007, 4 marks)

Answer

Integrated Accounting System:

It is such a system of accounting whereby cost and financial accounts are kept in the same set of books. Obviously, then there will be no separate set of books for costing and financial records. Integrated accounts provide or meets out fully the information requirements for costing as well as financial accounts.

Advantages of Integrated Accounting System:

(i) The question of reconciling of costing and financial profits does not arise, as there is one figure of profit only.

(ii) Due to use of one set of books, there is significant extent of saving in efforts made.

(iii) No delay is caused in obtaining information as it is provided from books of original entry.

(iv) It is economical as it is based on the concept of centralisation of Accounting function.

Question 37

ABC Ltd. has furnished the following information from the financial books for the year ended 31st March, 2007:

Profit & Loss Account

		Rs.			Rs.
To	Opening stock		By	Sales (10,250 units)	28,70,000
	(500 units at Rs. 140 each)	70,000	By	Closing stock	
	Material consumed	10,40,000		(250 units at Rs. 200 each)	50,000
	Wages	6,00,000			
	Gross profit c/d	12,10,000			
		29,20,000			29,20,000

To	*Factory overheads*	*3,79,000*	*By*	*Gross profit b/d*	*12,10,000*
	Administration overheads	*4,24,000*		*Interest*	*1,000*
	Selling expenses	*2,20,000*		*Rent received*	*40,000*
	Bad debts	*16,000*			
	Preliminary expenses	*20,000*			
	Net profit	*1,92,000*			
		12,51,000			*12,51,000*

The cost sheet shows the cost of materials at Rs. 104 per unit and the labour cost at Rs. 60 per unit. The factory overheads are absorbed at 60% of labour cost and administration overheads at 20% of factory cost. Selling expenses are charged at Rs. 24 per unit. The opening stock of finished goods is valued at Rs. 180 per unit.

You are required to prepare:

(i) A statement showing profit as per Cost accounts for the year ended 31st March, 2007; and

(ii) A statement showing the reconciliation of profit as disclosed in Cost accounts with the profit shown in Financial accounts. (May 2007, 10 marks)

Answer

(i) Statement of profit as per cost accounts

	Units	*Rs.*
Opening stock @ Rs. 180 per unit	500	90,000
Cost of production @ Rs. 240 per unit		
(Refer Working Note 1)	10,000	24,00,000
Total	10,500	24,90,000
Less: Closing stock @ Rs. 240 per unit	–250	–60,000
	10,250	24,30,000
Selling expenses @ Rs. 24 per unit		2,46,000
Cost of sales		26,76,000
Profit		1,94,000
Sales	10,250	28,70,000

Working Notes:

(1) Statement of Cost (10,000 units)

	Total cost	*Cost per unit*
	Rs.	*Rs.*
Materials	10,40,000	104.00
Wages	6,00,000	60.00
Factory Overhead 60% of wages	3,60,000	36.00
Factory cost	20,00,000	200.00
Administrative overhead 20% of factory cost	4,00,000	40.00
Total cost	24,00,000	240.00

(2) Statement of differences between the two set of accounts:

	Financial A/c	Cost A/c	Difference	Remarks
	Rs.	*Rs.*	*Rs.*	
Factory overhead	3,79,000	3,60,000	19,000	Under recovery
Administrative overhead	4,24,000	4,00,000	24,000	Under recovery
Selling expenses	2,20,000	2,46,000	26,000	Over recovery
Opening stock	70,000	90,000	20,000	Over recovery
Closing stock	50,000	60,000	10,000	Over recovery

(ii) Reconciliation Statement

		Rs.
Profit as per cost accounts		1,94,000
Less: Under recovery of Overhead in Cost A/c		
Factory Overhead	19,000	
Administrative Overhead	24,000	–43,000
Add: Over-recovery of selling overhead in Cost A/c		+26,000
Add: Over-valuation of opening stock in Cost A/c		+20,000
Less: Over-valuation of closing stock in Cost A/c		–10,000
Add: Income excluded from Cost A/c		

Interest	1,000	
Rent	40,000	+41,000
Less: Expenses excluded from Cost A/c		
Bad debts	16,000	
Preliminary expenses	20,000	–36,000
Profit as per financial account		1,92,000

Question 38

Discuss the reasons for disagreement of profits as per Cost Accounting and Financial Accounting. *(November 2007, 4 marks)*

Answer

Reasons for disagreement of profits as per Cost Accounting and Financial Accounting:

Items included in the financial accounts but not in Cost Accounts

(i) Appropriation of profits
  (i) Income tax
  (ii) Transfer to General Reserve
  (iii) Dividend paid
  (iv) Amount written off e.g. goodwill, preliminary expenses, debenture discount etc.

(ii) Matters of pure finance
  (i) Interest received on bank deposits/investments
  (ii) Dividends received
  (iii) Losses on sale of investment, building.
  (iv) Profit on sale of fixed assets
  (v) Transfer fees
  (vi) Damages/penalties

(iii) Items included in Cost Accounting
  (i) Opportunity cost of building owned.
  (ii) Interest on capital employed in production
  (iii) Salary of proprietor.

(iv) Under / over absorbed overheads in Cost Accounting

(v) Differences due to varying basis of valuation of inventory.

Question 39

The following figures have been extracted from the cost records of a manufacturing company:

Stores	*Rs.*
Opening Balance	*63,000*
Purchases	*3,36,000*
Transfer from Work-in-progress	*1,68,000*
Issues to Work-in-progress	*3,36,000*
Issues to Repairs and Maintenance	*42,000*
Deficiencies found in Stock taking	*12,600*
Work-in-progress:	
Opening Balance	*1,26,000*
Direct Wages applied	*1,26,000*
Overhead Applied	*5,04,000*
Closing Balance	*84,000*

Finished Products:

Entire output is sold at a Profit of 10% on actual cost from work-in-progress.

Others: Wages incurred Rs. 1,47,000; Overhead incurred Rs. 5,25,000.

Income from investment Rs. 21,000; Loss on sale of Fixed Assets Rs. 42,000.

Draw the stores control account, work-in-progress control account, costing profit and loss account, profit and loss account and reconciliation statement.

(May 2008,10 marks)

Answer

Stores Ledger Control Account

		Rs.			Rs.
To	Balance c/d	63,000	By	Work-in-progress	3,36,000
To	General Ledger Adjustment A/c	3,36,000	By	Overhead A/c	42,000
To	Work-in-progress A/c	1,68,000	By	Overhead A/c (Deficiency Assumed as Normal)	12,600

		_____	By	Balance c/d	1,76,400
		5,67,000			5,67,000

Work-in-progress Control Account

		Rs.			Rs.
To	Balance b/d	1,26,000	By	Stores Ledger Control A/c	1,68,000
To	Stores Ledger Control A/c	3,36,000	By	Costing Profits & Loss A/c (Finished goods at cost	
To	Work-in-progress A/c	1,26,000		Balancing figure)	8,40,000
To	Overhead A/c (applied)	5,04,000	By	Balance c/d	84,000
		10,92,000			10,92,000

Costing Profit and Loss Account

		Rs.			Rs.
To	Work-in-Progress A/c	8,40,000	By	General Ledger Adjustment A/c Sales (8,40,000 + 84,000)	9,24,000
To	General Ledger Adjustment A/c (Profit)	84,000			
		9,24,000			9,24,000

Financial Profit and Loss Account

			Rs.				*Rs.*
To	Opening Stock			By	Sales		9,24,000
	Stores	63,000		By	Income from investment		21,000
	WIP	1,26,000	1,89,000	By	Closing Stock		
To	Purchases		3,36,000		Stores	1,76,400	
To	Wages		1,47,000		WIP	84,000	2,60,400
To	Overhead		5,25,000	By	Loss		33,600
To	Loss on sale of fixed assets		42,000				
			12,39,000				12,39,000

Reconciliation Statement

		Rs.
Profit as per Cost Account		84,000
Add: Income from investment		21,000
		1,05,000
Less: Under absorption of overhead	96,600	
Loss on sale of fixed assets	42,000	1,38,600
Loss as per financial account		33,600

Note: Deficiency in stock taking may be treated as abnormal loss and it can be transferred from stores ledger Control Account to Costing Profit and Loss Account. Then consequential changes in accounting entries in overheads Control Account has to be done.

Working Notes:

Overheads Control Account

		Rs.			*Rs.*
To	Stores Ledger Control A/c	42,000	By	Work-in-Progress	5,04,000
To	Stores Ledger Control A/c	12,600	By	Balanced c/d	96,600
To	Wages Control A/c				
	Indirect Wages				
	(1,47,000 – 1,26,000)	21,000			
To	General Ledger Adjustment A/c	5,25,000			
		6,00,600			6,00,600

7
Job Costing & Batch Costing

Question 1

Describe job Costing and Batch Costing giving example of industries where these are used?

(May, 2001, 3 marks)

Answer

Job Costing: It is a method of costing which is used when the work is undertaken as per the customer's special requirement. When an inquiry is received from the customer, costs expected to be incurred on the job are estimated and on the basis of this estimate, a price is quoted to the customer. Actual cost of materials, labour and overheads are accumulated and on the completion of job, these actual costs are compared with the quoted price and thus the profit or loss on it is determined.

Job costing is applicable in printing press, hardware, ship-building, heavy machinery, foundry, general engineering works, machine tools, interior decoration, repairs and other similar work.

Batch Costing: It is a variant of job costing. Under batch costing, a lot of similar units which comprises the batch may be used as a unit for ascertaining cost. In the case of batch costing separate cost sheets are maintained for each batch of products by assigning a batch number. Cost per unit in a batch is ascertained by dividing the total cost of a batch by the number of units produced in that batch.

Such a method of costing is used in the case of pharmaceutical or drug industries, readymade garment industries, industries, manufacturing electronic parts of T.V. radio sets etc.

Question 2

Distinguish between Job Costing & Batch Costing? (Nov, 2004, Nov, 2006, 2 marks)

Answer

Job Costing and Batch Costing

Accounting to job costing, costs are collected and accumulated according to job. Each job or unit of production is treated as a separate entity for the purpose of costing. Job costing may be employed when jobs are executed for different customers according to their specification.

Batch costing is a form of job costing, a lot of similar units which comprises the batch may be used as a cost unit for ascertaining cost. Such a method of costing is used in case of pharmaceutical industry, readymade garments, industries manufacturing parts of TV, radio sets etc.

Question 3

Distinguish between job costing and process costing?

Answer

The main points which distinguishes job costing and process costing are as below:

	Job Costing	**Process Costing**
(i)	A Job is carried out or a product is produced by specific orders.	The process of producing the product has a continuous flow and the product produced is homogeneous.
(ii)	Costs are determined for each job.	Costs are compiled on time basis i.e., for production of a given accounting period for each process or department.
(iii)	Each job is separate and independent of other jobs.	Products lose their individual identity as they are manufactured in a continuous flow.
(iv)	Each job or order has a number and costs are collected against the same job number.	The unit cost of process is an average cost for the period.
(v)	Costs are computed when a job is completed. The cost of a job may be determined by adding all costs against the job.	Costs are calculated at the end of the cost period. The unit cost of a process may be computed by dividing the total cost for the period by the output of the process during that period.
(vi)	As production is not continuous and each job may be different, so more managerial attention is required for effective control.	Process of production is usually standardized and is therefore, quite stable. Hence control here is comparatively easier.

Question 4

(a) What do you understand by Batch Costing? In which industries it is applied?

(b) Leo Limited undertakes to supply 1,000 units of a component per month for the months of January, February and March 1987. Every month a batch order is opened against which

materials and labour cost are booked at actual. Overheads are levied at a rate per labour hour. The selling price is contracted at Rs. 15/- per unit.

From the following data, present the cost and profit per unit of each batch order and the overall position of the order for the 3,000 units.

Month	*Batch Output (Numbers)*	*Material Cost Rs.*	*Labour Cost Rs.*
January 1987	*1,250*	*6,250*	*2,500*
February 1987	*1,500*	*9,000*	*3,000*
March 1987	*1,000*	*5,000*	*2,000*

Labour is paid at the rate of Rs. 2 per hour. The other details are:

Month	*Overheads*	*Total Labour Hours*
January 1987	*12,000*	*4,000*
February 1987	*9,000*	*3,000*
March 1987	*15,000*	*5,000*

Answer

(a) *Batch Costing:* It is a form of job costing. In this, the cost of a group of products is ascertained. The unit of cost is a batch or a group of identical products instead of a single job, order or contract. Separate cost sheets are maintained for each batch of products by assigning a batch number. The cost per unit is ascertained by dividing the total cost of a batch by the number of items produced in that batch.

Batch costing is employed by companies manufacturing in batches. It is used by readymade garment factories for ascertaining the cost of each batch of cloths made by them. Pharmaceutical or drug industries, electronic component manufacturing units, radio manufacturing units too use this method of costing for ascertaining the cost of their product.

(b) Leo Limited

Statement of Cost and Profits Per Unit of Each Batch

		January	*February*	*March*	*Total*
(A)	Batch Output (Numbers)	1,250	1,500	1,000	3,750
		Rs.	*Rs.*	*Rs.*	*Rs.*

(B)	Sales Value	18,750	22,500	15,000	56,250
(C)	*Costs*	Jan. '87	Feb '87	March '87	Total
		Rs.	*Rs.*	*Rs.*	*Rs.*
	Material	6,250	9,000	5,000	20,250
	Wages	2,500	3,000	2,000	7,500
	Overheads*	3,750	3,000	3,000	9,750
	Total	12,500	15,000	10,000	37,500
(D)	Profit/Batch (B–C)	6,250	7,500	5,000	18,750
(E)	Cost/Unit (C÷A)	10	10	10	
(F)	Profit/Unit (D÷A)	5	5	5	

** See note (ii)*

Notes

		Jan'87	*Feb'87*	*March'87*
(i)	Labour Hours (Labour Cost/Labour rate per hour)	$\left(\frac{Rs.2,500}{2}\right)$	$\left(\frac{Rs.3,000}{2}\right)$	$\left(\frac{Rs.2,000}{2}\right)$
		=Rs.1,250	=Rs.1,500	=Rs.1,000
(ii)	Overheads per hour (Total Overhead/ Total Labour hours)	$\left(\frac{Rs.12,000}{4,000}\right)$	$\left(\frac{Rs.9,000}{4,500}\right)$	$\left(\frac{Rs.15,000}{5,000}\right)$
		Rs.3	Rs.2	Rs.3
(iii)	Overhead for the batch (i)×(ii)	Rs.3,750	Rs.3,000	Rs.3,000

Overall position for 3,000 units

	Rs.
Sales Value (3,000 units × Rs.15)	45,000
Less: Total Cost (3,000 units × Rs.10)	30,000
Profit	15,000

Question 5

Define Product costs. Describe three different purposes for computing product costs.

(Nov, 1999, 4 marks)

Answer

Definition of product costs

Product costs are inventoriable costs. These are the costs, which are assigned to the product. Under marginal costing variable manufacturing costs and under absorption costing, total manufacturing costs constitute product costs.

Purposes for computing product costs:

The three different purposes for computing product costs are as follows:

(i) *Preparation of financial statements:* Here focus is on inventoriable costs.

(ii) *Product pricing:* It is an important purpose for which product costs are used. For this purpose, the cost of the areas along with the value chain should be included to make the product available to the customer.

(iii) *Contracting with government agencies:* For this purpose government agencies may not allow the contractors to recover research and development and marketing costs under cost plus contracts.

Question 6

In Batch Costing, how is Economic Batch Quantity determined? (May, 2001, 3 marks)

Answer

Economic batch quantity in Batch Costing

In batch costing the most important problem is the determination of 'Economic Batch Quantity'

The determination of economic batch quantity involves two type of costs viz, (i) set up cost and (ii) carrying cost. With the increase in the batch size, there is an increase in the carrying cost but the set-up cost per unit of the product is reduced; this situation is reversed when the batch size is reduced. Thus there is one particular batch size for which both set up and carrying costs are minimum. This size of a batch is known as economic or optimum batch quantity.

Economic batch quantity can be determined with the help of a table, graph or mathematical formula. The mathematical formula usually used for its determination is as follows:

$$EBQ = \sqrt{\frac{2DC}{C}}$$

Where, D = Annual demand for the product

S = Setting up cost per batch

C = Carrying cost per unit of production per annum

Question 7

A factory incurred the following expenditure during the year 2007:

		Rs.
Direct material consumed		*12,00,000*
Manufacturing Wages		*7,00,000*
Manufacturing overhead:		
Fixed	*3,60,000*	
Variable	*2,50,000*	*6,10,000*
		25,10,000

In the year 2008, following changes are expected in production and cost of production.

(i) Production will increase due to recruitment of 60% more workers in the factory.

(ii) Overall efficiency will decline by 10% on account of recruitment of new workers.

(iii) There will be an increase of 20% in Fixed overhead and 60% in Variable overhead.

(iv) The cost of direct material will be decreased by 6%.

(v) The company desire to earn a profit of 10% on selling price.

Ascertain the cost of production and selling price. *(May, 2008, 8 marks)*

Answer

Budgeted Cost Sheet for the year 2008

Particulars		*Amount Rs.*
Direct material consumed	12,00,000	
Add: 44% due to increased output	5,28,000	

		17,28,000	
Less: 6% for decline in price		1,03,680	16,24,320
Direct wages (manufacturing)		7,00,000	
Add: 60% increase		4,20,000	11,20,000
Prime cost			27,44,320
Manufactured Overhead:			
Fixed	3,60,000		
Add: 20% increase	72,000		
		4,32,000	
Variable	2,50,000		
Add: 60% increase	1,50,000		
		4,00,000	8,32,000
Cost of production			35,76,320
Add: 1/9 of Cost or 10% on selling price			3,97,368.88
Selling price			39,73,688.88

Production will increase by 60% but efficiency will decline by 10%.

160 – 10% of 160 = 144%

So increase by 44%.

Note: If we consider that variable overhead once will change because of increase in production (From 2,50,000 to 4,00,000) then with efficiency declining by 10% it shall be 3,60,000 and then again as mentioned in point No. (iii) of this question it will increase by 60% then variable overhead shall be Rs. 3,60,000 × 160% = 5,76,000. Hence, total costs shall be Rs. 37,52,320 and profit shall be 1/9th of Rs. 37,52,320 = 4,16,924. Thus, selling price shall be 41,69,244.

Alternative Solution:

Students may use a combined factor to arrive at the figures in respect of materials and variable overheads as under:

2007 production	100	
Increase in 2008:	60%	= 160%
Efficiency decline 10%	160 × 90%	= 144%

Materials	12,00,000 × 144% = Rs. 17,28,000
Variable overheads	2,50,000 × 144% = Rs. 3,60,000

Note: Variable overhead is a product cost and consequently if the output increases by 44%, the variable overheads will also go up proportionately with the increase in output. The other 60% increase given in the question is the increase in expense or rate or price of the overhead items like increase tariff, increase in the prices of consumables etc.

8
Contract Costing

Question 1

(i) Discuss the implications of cost-plus contracts from the view points of:

(a) the manufacturer

(b) the customer.

(ii) What is the relevance of escalation clause provided in the contracts?

Answer

(i) (a) 'Cost Plus Contract' and Manufacturer: 'Cost Plus Contract' is a contract is which the value of the contract is ascertained by adding a fixed margin of profit to the total cost of the contract. The favourable implications of cost-plus-contracts from the view point of the manufacturer are the following:

(1) The manufacturer is assured of a certain percentage of profit in advance.

(2) The manufacturer is protected against any fluctuations in the market prices of the various cost elements involved in the production.

(3) It is of considerable benefit when the cost estimates are not firm or reliable for some reason or the other e.g., figures for the previous years may not be available.

(4) The possibility of incurring any loss is completely eliminated.

In spite of these advantages there is a fundamental drawback. If the contractor effects any economy, it will lead to a lower profit to him. Thus he cannot make profit as much as he would have from a fixed price contract.

(b) 'Cost Plus Contract' and the Customer: The favourable implications of 'Cost Plus Contract' from the view point of customer are given below:

(1) The customer feels satisfied because he believes that the contract price has not been fixed up arbitrarily.

(2) The price paid by the customer depends upon the actual cost.

(3) The customer is completely fortified in the situation of an uncertain market.

The main drawbacks from the customer's point of view are as follows:

(1) The price which the customer has to pay under the contract depends upon the cost of the contract and the same cannot be ascertained until the work is

complete. He may feel that the price he has to pay would not be arbitrary, yet the amount he has to pay is bound to be uncertain.

(2) Due to complete security about profit margin there may not be any incentive for the manufacturer to reduce costs; in fact he will tend to increase the costs.

(ii) When a contract is likely to take long to complete or even to commence and the price is fixed, the contractor would like to protect his interest against a high rise in the prices of materials, wage rates etc. This he does through what is called an "escalation clause' which states the increase in the contract price for a given increase in the prices of inputs. For example, it may state that if the price of steel goes up by 10%, the contract price will increase by 1.5%. This implies that the base prices of inputs should be agreed upon and also that the date after which increase in prices will be taken into account will be fixed. The contractor is not compensated for price changes which could be avoided, for example, by completing the contract on time.

It is not necessary that the contractee must agree to the escalation clause; it is a matter of negotiation between the two parties.

Question 2

Discuss briefly the principles to be followed while taking credit for profit on incomplete contracts.

Answer

Under Contract Accounting it may be noticed that certain contracts are completed, while others are still in progress at the end of a financial year. These incomplete contracts may require a few more years for their completion. The figures of profit made (the excess of credit over the debit items in a contract) on completed contracts can be safely taken to the credit of Profit and Loss Account, but this practice is not being followed in the case of incomplete contracts.

In the case of incomplete contracts the entire profit is not being credited to Profit and Loss Account because some provision is to be made for meeting contingencies and unforeseen losses. There are no hard and fast rules regarding the calculation of figure of profit to be taken to the credit of profit and loss account. However, the following principles may be followed:–

(i) Profit should be considered in respect of work certified and uncertified work should be valued at cost.

(ii) If the amount of work certified is less than 1/4th of the contract price, no profit should be taken to Profit and Loss Account. The entire amount in such contracts should be kept as reserve for meeting out contingencies.

(iii) If the amount of work certified is 1/4th or more but less than 1/2 of the contract price, then 1/3rd of the profit disclosed as reduced by the percentage of cash received from the contractee should be taken to the Profit and Loss Account. The balance should be allowed to remain as a reserve.

(iv) If the amount of work certified is $\frac{1}{2}$ or more of the contract price, then 2/3rd of the profit disclosed as reduced by the percentage of cash received from the contractee, should be taken to the Profit and Loss Account. The balance should be treated as reserve.

(v) If the contract is near completion, the total cost of completing the contract may be estimated if possible. By deducting the total estimated cost from the contract price, the estimated total profit of the contract should be calculated. The proportion of total estimated profit on cash basis, which the work certified bears to the total contract price should be credited to profit and loss account.

(vi) The entire loss, if any, should be transferred to the Profit and Loss Account.

Question 3

Write note on cost-plus-contracts. *(Nov., 2000, 2 marks)*

Answer

These contracts provide for the payment by the contractree of the actual cost of manufacture plus a stipulated profit, mutually decided between the two parties.

The main features of these contracts are as follows:

1. The practice of cost-plus contracts is adopted in the case of those contracts where the probable cost of the contracts cannot be ascertained in advance with a reasonable accuracy.
2. These contracts are preferred when the cost of material and labour is not steady and the contract completion may take number of years.
3. The different costs to be included in the execution of the contract are mutually agreed, so that no dispute may arise in future in this respect. Under such type of contracts, contractee is allowed to check or scrutinize the concerned books, documents and accounts.
4. Such a contract offers a fair price to the contractee and also a reasonable profit to the contractor.
5. The contract price here is ascertained by adding a fixed and mutually pre-decided component of profit to the total cost of the work.

Question 4

Write notes on Escalation Clause *(Nov. 2000, 2 marks, May 1994, 4 marks)*

Answer

Escalation Clause: This clause is usually provided in the contracts as a safeguard against any likely changes in the price or utilization of material and labour. If during the period of execution of a contract, the prices of materials or labour rise beyond a certain limit, the contract price will be increased by an agreed amount. Inclusion of such a term in a contract deed is known as an 'escalation clause'

An escalation clause usually relates to change in price of inputs, it may also be extended to increased consumption or utilization of quantities of materials, labour etc. In such a situation the contractor has to satisfy the contractee that the increased utilization is not due to his inefficiency.

Question 5

Discuss briefly the principles to be followed while taking credit for profit on incomplete contracts *(May, 1999, 6 marks)*

Answer

Principles to be followed while taking credit for profit on incomplete contracts:

The portion of profit to be credited to, profit and loss account should depend on the stage of completion of the contract. This stage of completion of the contract should refer to the certified work only. For this purpose, uncertified work should not be considered as for as possible. For determining the credit for profit, all the incomplete contracts should be classified into the following four categories.

(i) Contract less than 25% complete

(ii) Contracts between 25% and 50% complete

(iii) Contracts between 50% and 90% complete

(iv) Contracts nearing completion, say between 90% and 100% complete.

The transfer of profit to the profit and loss account in each of the above cases is done as under:

(i) *Contract less than 25% complete:* if the contract has just started or it is less than 25% complete, no profit should be taken into account.

(ii) *Contract between 25% and 50% complete:* In this case one third of the notional profit reduced in the ratio of cash received to work certified, may be transferred to the profit and loss account. The amount of profit to be transferred to the profit and loss account may be determined by using the following formula:

$$\frac{1}{3} \times \text{Notional profit} \times \frac{\text{Cash received}}{\text{Work certified}}$$

(iii) *Contract between 50% and 90% complete:* In this case, two third of the notional profit, reduced by the portion of cash received to work certified may be transferred to the profit and loss account. In this case the formula to be used is as under:

$$\frac{2}{3} \times \text{Notional profit} \times \frac{\text{Cash received}}{\text{Work certified}}$$

(iv) *Contract nearing completion:* When a contract is nearing completion or 90% or more work has been done on a contract. The amount of profit to be credited to profit and loss account may be determined by using any one of the following formula.

(a) Estimated profit × $\frac{\text{Work certified}}{\text{Contract price}}$

(b) Estimated profit × $\frac{\text{Work certified}}{\text{Contract price}} \times \frac{\text{Cash received}}{\text{Work certified}}$

or Estimated profit × $\frac{\text{Work certified}}{\text{Contract price}}$

(c) Estimated Profit × $\frac{\text{Cost of work to date}}{\text{Estimated total cost}}$

(d) Estimated profit × $\frac{\text{Cost of work to date}}{\text{Estimated total cost}} \times \frac{\text{Cash received}}{\text{Work certified}}$

(e) Notional profit × $\frac{\text{Work certified}}{\text{Contract price}}$

Question 6

Discuss the process of estimating profit/loss on incomplete contracts

(Nov., 2003, 4 marks)

Answer

Process of estimating profit / loss on incomplete contracts

(i) If completion of contract is less than 25% no profit should be taken to profit and loss account.

(ii) If completion of contract is upto 25% or more but less than 50% then

$1/3 \times \text{Notional Profit} \times \frac{\text{Cash received}}{\text{Work certified}}$

may be taken to profit and loss account.

(iii) If completion of contract is 50% or more but less than 90% then

$2/3 \times \text{Notional Profit} \times \frac{\text{Cash received}}{\text{Work certified}}$

may be taken to profit and loss account

(iv) If completion of contract is greater than or equal to 90% then one of the following formulas may be used for taking the profit to profit and loss account.

1. Estimated Profit × $\frac{\text{Work certified}}{\text{Contract price}}$

2. Estimated Profit × $\frac{\text{Work certified}}{\text{Contract price}} \times \frac{\text{Cash received}}{\text{Work certified}}$

3. Estimated Profit × $\frac{\text{Cost of the work to date}}{\text{Estimated total cost}}$

4. Estimated Profit × $\frac{\text{Cost of the work to date}}{\text{Estimated total cost}} \times \frac{\text{Cash received}}{\text{Work certified}}$

5. Notional Profit × $\frac{\text{Work certified}}{\text{Contract price}}$

Question 7

What are the main features of 'Cost-Plus-Contracts' *(Nov., 1996, 4 marks)*

Answers

Main features of cost-plus-contracts:

1. This method is adopted in the case of those contracts where the probable cost of contract cannot be ascertained in advance with a reasonable accuracy.
2. These contracts are preferred when the cost of material and labour is not steady and contract completion may take number of years.
3. The different costs to be included in the execution of the contract are mutually agreed so that no dispute may arise in future in this respect. Under such type of contract contractee is allowed to check or scrutinise the concerned books, documents accounts.
4. Such a contract offers a fair price to the contractee and also a reasonable profit to contractor.
5. The contract price here is ascertained by adding a fixed and mutually pre-decided component of profit to the total cost of the work.

Question 8

The following particulars are obtained from the books of Vinak Construction Ltd. as on March 1983:

Plant and Equipment at cost	*Rs. 4,90,000*
Vehicles at cost	*Rs. 2,00,000*

Details of contract which remain uncompleted as on 31.03.1983:–

	Contract Nos.		
	V.20	*V.24*	*V.25*
	(Rs. Lacs)	*(Rs. Lacs)*	*(Rs. Lacs)*
Estimated final sales value	*7.00*	*5.60*	*16.00*

Estimated final cost	*6.40*	*7.70*	*12.00*
Wages	*2.40*	*2.00*	*1.20*
Materials	*1.00*	*1.10*	*0.44*
Overheads (excluding depreciation)	*1.44*	*1.46*	*0.58*
Total costs to date	*4.84*	*4.56*	*2.22*
Value certified by architects	*7.20*	*4.20*	*2.40*
Progress payments received	*5.00*	*3.20*	*2.00*

Depreciation of Plant and Equipment and Vehicle should be charged at 20% to the three contracts in proportion to work certified.

You are required to prepare statements to show contractwise and total:

(i) Profit/loss to be taken to the P&L A/c for the year ended 31st March 1983;

(ii) Work-in-progress as would appear in the Balance Sheet as at 31st March 1983.

Answer (i)

Vinak Construction Co. Ltd.
Statement of Profit / Loss to be taken to Profit & Loss Account
(for the year ended 31st March, 1983)

	Contract Nos.			
	V.20	*V.24*	*V.25*	*Total*
	(Rs. Lacs)	*(Rs. Lacs)*	*(Rs. Lacs)*	*(Rs. Lacs)*
A. Percentage of completion				
Estimated sales value	8.00	5.60	16.00	—
Work certified	7.20	4.20	2.44	—
Percentage of completion	90	75	15	—
(See note 1)				
B. Estimated result on completion				
Estimated sale value	8.00	5.60	16.00	—
Estimated Costs	6.40	7.00	12.00	—
Estimated profit (loss)	1.60	(1.40)	4.00	—
C. Results to date				
Work certified	7.20	4.20	2.10	13.80
Cost to date (excluding depreciation)	4.84	4.56	2.22	11.62
Depreciation	0.72	0.42	0.24	1.38
(See note 2)				

Total cost	5.56	4.98	2.46	13.80
Notional profit (loss)	1.64	(0.78)	(0.06)	0.80
Profit (loss) to be taken to Profit & Loss account *(See note 3)*	1.00	1.40	0.06	0.46
Reserve for contingencies *(See note 4)*	0.64	0.62	—	1.26

(ii) **Vinak Construction Co. Ltd.**
Statement of Work-in-Progress as would appear in Balance Sheet on 31 March, 1983

	Contract Nos.			
	V.20	*V.24*	*V.25*	*Total*
	(Rs. Lacs)	*(Rs. Lacs)*	*(Rs. Lacs)*	*(Rs. Lacs)*
Work certified	7.20	4.20	20.40	13.80
Less: Reserve for contingencies	0.64	0.62	—	1.26
Less: Payment received	5.00	3.20	2.00	10.20
Work in progress	1.56	0.38	0.40	2.34

Working Notes

1. Percentage of completion = $\frac{\text{Work Certified}}{\text{Estimated Sales value}} \times 100$

   Percentage of completion for : V.20 = $\frac{\text{Rs.7.20}}{\text{Rs.8.00}} \times 100 = 90$

   Percentage of completion for : V.24 = $\frac{\text{Rs.4.20}}{\text{Rs.5.60}} \times 100 = 75$

   Percentage of completion for: V.25 = $\frac{\text{Rs.2.40}}{\text{Rs.16.00}} \times 100 = 15$

2. Total cost of plant, equipment and vehicle = Rs. 4,90,000 + Rs. 2,00,000
   = Rs. 6,90,000

   Total depreciation is 20% of the total cost of plant, equipment and vehicle.

   i.e. Rs. 6,90,000 or $\frac{20}{100}$ × Rs. 6,90,000 = Rs. 1,38,000

The total depreciation viz. Rs. 1,38,000 has been apportioned over three Contracts in the ratio of the work certified as below:

$$\text{Depreciation for Contract V.20} = \frac{\text{Rs.}1.38}{\text{Rs.}13.8} \times 7.2 = \text{Rs. } 0.72 \text{ lacs.}$$

$$\text{Depreciation for Contract V.24} = \frac{\text{Rs.}1.38}{\text{Rs.}13.8} \times 4.2 = \text{Rs. } 0.42 \text{ lacs}$$

$$\text{Depreciation of Contract V.25} = \frac{\text{Rs.}1.38}{\text{Rs.}13.8} \times 2.40 = \text{Rs. } 0.24 \text{ lacs.}$$

3. Since the contract V.20 is almost complete therefore the profit to be taken to Profit and Loss account is calculated as follows:

$$\text{Profit} = \text{Estimated profit (on completed contract)} \times \frac{\text{Cash Received}}{\text{Contract Price}}$$

$$= \text{Rs } 1.60 \text{ Lacs} \times \frac{5}{8} = \text{Rs. } 1 \text{ Lac.}$$

Other methods which could also be used to calculate the profit under Contract V.20 are:

(a) $\text{Estimated profit} \times \frac{\text{Work certified}}{\text{Contract Price}}$

(b) $\text{Estimated profit} \times \frac{\text{Cost of Work to date}}{\text{Estimated total cost}}$

(c) $\text{Estimated profit} \times \frac{\text{Cost of work to date}}{\text{Estimated total cost}} \times \frac{\text{Cash received}}{\text{Work certified}}$

4. The total loss of Rs. 1.40 lacs as shown by Contract V.24, should be taken to profit and loss account. This amount includes loss of current year (Rs. 0.78 Lacs) and the loss which the contractor has to bear before the completion of the contract (Rs. 0.62 Lacs).

Question 9

Deluxe Limited undertook a contract for Rs.5,00,000 on 1st July, 1986. On 30th June, 1987 when the accounts were closed, the following details about the contract were gathered:

	Rs.
Materials Purchased	*1,00,000*
Wages Paid	*45,000*

General Expenses	*10,000*
Plant Purchased	*50,000*
Materials on Hand 30.06.87	*25,000*
Wages Accrued 30.06.87	*5,000*
Work Certified	*2,00,000*
Cash Received	*1,50,000*
Work Uncertified	*15,000*
Depreciation of Plant	*5,000*

The above contract contained an escalator clause which read as follows:

"In the event of prices of materials and rates of wages increase by more than 5% the contract price would be increased accordingly by 25% of the rise in the cost of materials and wages beyond 5% in each case."

It was found that since the date of signing the agreement the prices of materials and wage rates increased by 25%. The value of the work certified does not take into account the effect of the above clause.

Prepare the contract account. Workings should form part of the answer.

Answer

Contract Account of Deluxe Limited
(for the year ending 30th June, '87)

	Rs.		*Rs.*
To Materials	1,00,000	By Work-in Progress	
To Wages paid and accrued	50,000	By Work certified	2,00,000
To General expenses	10,000	By Work uncertified	15,000
To Plant depreciation	5,000	By Materials on hand	25,000
To Profit and Loss A/c	20,000	By Contract Escalation	5,000
(See note 2)		*(See note 1)*	
To Balance c/d	60,000		
	2,45,000		2,45,000
To Work in progress b/d			
To Work certified	2,00,000		
To Work uncertified	15,000		
To Materials on hand	25,000		
To Escalation	5,000		
	2,45,000		
Less: Balance c/d	60,000		
	1,85,000		

Working Note:

1. **Calculation of Escalation**:

	Total Increase Rs.	*Upto 5%* Rs.	*Beyond 5%* Rs.
Materials:	15,000	3,000	12,000
(Effect of increase in price)			
(Rs. 1,00,000 – Rs. 20,000) × $\frac{25}{125}$			
Wages	10,000	2,000	8,000
(Effect of increase in wage rates)			
$\left(\text{Rs.}50{,}000 \times \frac{25}{125}\right)$			
Total Increase	25,000	5,000	20,000

Increase in Contract price = 25% of Increase in Material and wages beyond 5%

= 25% of Rs. 20,000 = Rs. 5,000

2. **Calculation of Profit to be transferred:**

Since the contract is completed between 25% to 50%, one third of the notional profit as reduced by the proportion of cash received to work certified is transferred:

$$\text{Notional profit} \times \frac{1}{3} \times \frac{\text{Cash received}}{\text{Work certified}}$$

$$\text{Rs. } 80{,}000 \times \frac{1}{3} \times \frac{\text{Rs.}1{,}50{,}000}{\text{Rs.}2{,}00{,}000} = \text{Rs.}20{,}000$$

Question 10

Rex Limited commenced a contract on 01.07.1988. The total contract price was Rs. 5,00,000 but Rex Limited accepted the same for Rs. 4,50,000. It was decided to estimate the total profit and to take to the credit of profit and loss account that proportion of estimated profit on cash basis which the work completed bore to the total contract. Actual Expenditure till 31.12.1988 and estimated expenditure in 1989 are given below:–

Expenses	*Actuals Till 31.12.88* Rs.	*Estimate For 1989* Rs.
Materials	*75,000*	*1,30,000*
Labour	*55,000*	*60,000*
Plant Purchased (original cost)	*40,000*	—

Misc. Expenses	*20,000*	*35,500*
Plant Returned to Stores on 31.12.88 at original cost	*10,000*	*35,500*
		As on 30.09.89
Materials at Site	*5,000*	*Nil*
Work Certified	*2,00,000*	*Full*
Work Uncertified	*7,500*	*Nil*
Cash Received	*1,80,000*	*Full*

The Plant is subject to annual depreciation @ 20% of original cost. The contract is likely to be completed on 30.09.1989.

You are required to prepare the contract account for the year ended 31.12.88. Workings should be clearly given.

It is the policy of the company to charge depreciation on time basis.

Answer

Rex Limited
Contract Account
(For the year ending 31.12.88)

	Rs.		*Rs.*
To Materials	75,000	By Plant returned to Stores	
To Labour	55,000	(Cost – Depreciation)	
To Plant	40,000	*(See Note-3)*	9,000
To Misc. Expenses	20,000	By Plant at site	27,000
To P/L A/c	26,400	*(See Note – 3)*	
(See Note – 2)		By Material at site	5,000
To Balance c/d	32,100	By WIP	
(Profit in reserve)		Work Certified	2,00,000
		Work Uncertified	7,500
	2,48,500		2,48,500

	Rs.	*Rs.*
To WIP		
Work Certified	2,00,000	
Work Uncertified	7,500	
To Plant at Site	27,000	
To Material at site	5,000	
	2,39,000	
Less: Reserve	32,100	2,07,400

Working Notes

(1) **Memorandum Contract Account**
(01.07.88 to 30.09.1989)

	Rs.		*Rs.*
To Material	2,05,000	By Plant returned to stores	27,750
To Labour	1,15,000	(Cost – Depreciation)	
To Plant	40,000	*(See Note 3(i) & (ii)*	
To Misc. Expenses	55,500	By Plant at Site	3,750
To Estimated Profit	66,000	*(See Note 3(iv)*	
		By Contractee's A/c	4,50,000
	4,81,500		4,81,500

(2) **Profit to be transferred to P/L A/c of the Contract ending on 31.12.88**

$$\text{Estimated Profit} \times \frac{\text{Cash Received}}{\text{Work Certified}} \times \frac{\text{Work Certified}}{\text{Total Contract Price}}$$

$$= \text{Rs. } 66{,}000 \times \frac{\text{Rs.}1{,}80{,}000}{\text{Rs.}2{,}00{,}000} \times \frac{\text{Rs.}2{,}00{,}000}{\text{Rs.}4{,}50{,}000}$$

= Rs. 26,400

Assumption: Work Certified is considered equal to work completed. On cash basis has been interpreted as cash received to work certified.

(3) (i) **Calculation of Plant returned to stores on 31-12-88**

	Rs.
Original Cost	10,000
Less: Depreciation @ 20% for 6 months	1,000
	9,000

(ii) **Plant at site on 30-12-88**

= (Original Cost of Plant – Plant returned – Depreciation)

= Rs. 40,000 – Rs. 10,000 – Rs. 3,000

= Rs. 27,000/-

(iii) **Plant returned to stores on 30-09-89**

	Rs.
Original Cost	25,000
Less: Depreciation	6,250
	18,750

(iv) **Plant at site on 30-9-89**	*Rs.*
Original Cost	5,000
Less: Depreciation	1,250
$\left(\text{Rs.}5{,}000 \times \frac{20}{100} \times \frac{15}{12}\right)$	3,750

Question 11

A contractor, who prepares his account on 31st December each year, commenced a contract on 1st April 1990. The costing records concerning the said contract reveal the following information on 31st December, 1990;

	Rs.
Materials charged to site	*2,58,100*
Labour engaged	*5,60,500*
Foremen's salary	*79,300*

Plants costing Rs. 2,60,000 had been on site for 146 days. Their working life is estimated at 7 years and their final scrap value at Rs. 15,000. A supervisor, who is paid Rs. 4,000 p.m. has devoted approximately three-fourths of his time to this contract. The administrative and other expenses amount to Rs. 1,40,000. Materials in hand at site on 31st December, 1990 cost Rs. 25,400. Some of the material costing Rs. 4,500 was found unsuitable and was sold for Rs. 4,000 and a part of the plant costing Rs. 5,500 (on 31.12.90) unsuited to the contract was sold at a profit of Rs. 1,000.

The contract price was Rs. 22,00,000 but it was accepted by the contractor for Rs. 20,00,000. On 31st December, 1990, two thirds of the contract was completed. Architect's certificate had been issued covering 50% of the contract price and Rs. 7,50,000 had so far been paid on account. Prepare contract account and state how much profit or loss should be included in the financial accounts to 31st December, 1990. Workings should be clearly given. Depreciation is charged on time basis.

Also prepare the Contractee's account and show how these accounts should appear in the Balance Sheet as on 31st December, 1990.

Answer

Contract Account
(for the period: between 1st April and 31st Dec. 1990)

	Rs.		*Rs.*
To Materials	2,58,100	By Materials at site	25,400
To Labour engaged	5,60,500	By Materials sold	4,000
To Foremen's salary	79,300	By Profit & Loss A/c (Loss on material sale)	500
To Supervisor's salary	27,000		
		By Cost of work done c/d	10,49,000

(See working note 1)			
To Depreciation of plant	14,000		
(See working note 2)			
To Administrative and other expenses	1,40,000		
	10,78,900		10,78,900
To Cost of work done b/d	10,49,000	By Work-in-Progress	
To Notional Profit c/d	2,13,250	Work certified	10,00,000
		Work uncertified	2,62,250
		(See Working Note 3)	
	12,62,250		12,62,250
To Profit & Loss A/c	1,06,625	By Notional Profit b/d	2,13,250
(See Working Note 4)			
To Profit Reserve	1,06,625		
	2,13,250		2,13,250

Contractee's Account

Dr.			*Cr.*
	Rs.		*Rs.*
To Balance c/d	7,50,000	By Cash	7,50,000

Balance Sheet
(as on 31st December, 1990)

	Rs.		*Rs.*	*Rs.*
Profit & Loss A/c	1,07,125	*Work-in-Progress*		
(See Working Note 4)		Work Certified	10,00,000	
		Work Uncertified	2,62,250	
			12,62,250	
		Less: Reserve	1,06,625	
			11,55,625	
		Less: Cash Received	7,50,000	4,05,625
		Material at site		25,400
		Plant at site		2,40,000
		(See Working Note 5)		

Working Notes

1. *Supervisor's Salary* = $\frac{3}{4}$ (9 months × Rs. 4,000) = Rs. 27,000

2. *Depreciation of Plant* = $\frac{\text{Rs.,2,60,000} - \text{Rs.15,000}}{7 \text{ years}} \times \frac{146}{365} = \text{Rs.14,000}$

3. *Cost of Work Uncertified*

   Cost of 2/3rd of the Contract is Rs. 10,49,000

   Hence the Cost of the Contract is Rs. 10,49,000 × $\frac{3}{2}$ = Rs. 15,73,500.

The cost of 50% of the Contract, which has been completed and certified by the Architect is Rs.7,86,750 (Rs. 15,73,500 ÷2).

The Cost of 1/6th of the contract, which has been completed but not certified by the Architect is Rs. 2,62,250 *(Rs. 10,49,000 – Rs. 7,86,750)*.

Profit & Loss A/c

	Rs.		*Rs.*
To Contract A/c	500	By Contract A/c	1,06,625*
(Loss on the sale of material)		*(Profit transferred)*	
		By Profit on the Sale of Plant.	1,000
To Balance c/d	1,07,125		
	1,07,625		1,07,625

* Profit transferred to P & L A.c = $\frac{2}{3}$ × Rs. 2,13,250 × Cash received / Work Certified

= $\frac{2}{3}$ × Rs. 2,13,250 × Rs. 7,50,000/Rs. 10,00,000

= Rs. 1,06,625

Plant A/c

	Rs.		*Rs.*
To Balance b/d	2,60,000	By Current A/c (Depreciation)	14,000
To P & L A/c	1,000	By Cash Sale	6,500
(Profit on Sale of Plant)		By Balance c/d	2,40,500
	2,61,000		2,61,000

Note: Plant A/c can also form part of Contract A/c

Question 12

Brock Construction Ltd. commenced a contract on November 1,2003. The total contract was for Rs. 39,37,500. It was decided to estimate the total profit on the contract and to take to the credit of P/L A/c that proportion of estimated profit on cash basis, which work completed bore to the total contract. Actual expenditure for the period November 1, 2003 to October 31, 2004 and estimated expenditure for November 1,2004 to March 31, 2005 are given below:

		November 1,2003 to October 31, 2004 (Actuals)	November 1,2004 to March 31 , 2005 (Estimated)
		Rs.	Rs.
Material issued		6,75,000	12,37,500
Labour	Paid	4,50,000	5,62,500
	Prepaid	25,000	
	Outstanding		2,500
Plant purchased		3,75,000	
Expenses	Paid	2,00,000	3,50,000
	Outstanding	50,000	25,000
Plant return to store		75,000	3,00,000
(Historical cost)		(on March 31, 2004)	(on March 31, 2005)
Work certified		20,00,000	Full
Work uncertified		75,000	
Cash received		17,50,000	
Material at site		75,000	37,500

The plant is subject to annual depreciation @ 33% on written down value method. The contract is likely to be completed on March 31, 2005.

Required

Prepare the contract A/.c Determine the profit on the contract for the year November, 2003 to October, 2004 on prudent basis, which has to be credited to P/L A/C

(Nov., 2004,8 marks)

Answer

Brock Construction Ltd. Contract A/c
(November 1, 2003 to Oct. 31, 2004)

Dr.				Dr.
Particulars		Amount (Rs.)		Amount (Rs.)
To Materials issued		6,75,000	By Plant returned to	
To Labour paid	4,50,000		store on 31/03/04	

Prepaid	25,000	4,25,000	at cost	75,000	
To Plant Purchased		3,75,000	*Less:* Dep (1/3)	10,417	64,583
To Expenses paid	2,00,000		By WIP		
To Outstanding	50,000	2,50,000	Certified	20,00,000	
To Notional profit		6,89,583	Uncertified	75,000	20,75,000
c/d		24,14,583	By Plant at site		
To P/L A/c		1,04,136	31/10/04 at		
2,34,305 ×			Cost	3,00,000	
(17,50,000 /			*Less:* Dep (1/3)	1,00,000	2,00,000
20,00,000)			By Materials at site		75,000
× (20,00,000 /					24,14,583
39,37,500)			By Notional Profit		
To Work-in-progress		5,85,447	b/d		6,89,583
(Profit in reserve)		6,89,583			6,89,583

Brock Construction Ltd. Contract A/c (1 November, 2003 to March 31, 2005)
(For computing estimated profit)

Dr.				*Cr.*
Particulars	*Amount (Rs.)*			*Amount (Rs.)*
To Material issued	19,12,500	By Material at site		37,500
(6,75,000+12,37,500)				
To Labour (paid &	10,15,000	By Plant returned to		64,583
outstanding)		stores on 31/3/04		
(4,25,000+5,87,500+2,500)		By Plant returned to		1,72,222
To Plant purchased	3,75,000	stores on 31/3/05		
		Cost	3,00,000	
		Less: Dep.	1,00,000	
		Less: 5 month Dep.	27,778	
To Expenses	5,75,000	By Contractee A/c		39,37,500
(2,50,000 + 3,25,000)				
To Estimated profit	2,34,305			
	42,11,805			42,11,805

Question 13

A lorry starts with a load of 20 tonnes of goods from station A. It unloads 8 tonnes at station B and rest of goods at station C. It reaches back directly to station A after getting reloaded with 16 tonnes of goods at station C. The distance between A to B, B to C and then

from C to A are 80 kms. 120, and 160 kms respectively. Compute 'Absolute tones – kms' and 'Commercial tones – kms'. (Nov., 1999,4 marks)

Answer

'Absolute tones – kms': It is the sum total of tones – kms. arrived at by multiplying various distances by respective load quantities carried. Mathematically it is:

= 20 tonnes × 80 kms + 12 tonnes × 120 kms + 16 tonnes × 160 kms.

= 5,600 tonnes – kms.

'**Commercial tones – kms**' = Average load × Total kms. travelled.

$$= \left(\frac{20+12+16}{3}\right) \text{tones} \times 350 \text{ kms.}$$

= 5,760 tonnes – kms.

Question 14

Paramount Engineers are engaged in construction and erection of a bridge under a long-term contract. The cost incurred upto 31.03.2001 was as under:

Fabrication	*Rs. In Lakhs*
Direct Material	*280*
Direct Labour	*100*
Overheads	*60*
	440
Erection costs to date	*110*
	550

The contract price is Rs. 11 crores and the cash received on account till 31.03.2001 was Rs.6 crores.

The technical estimate of the contract indicates the following degree of completion of work. Fabrication – Direct Material – 70%, Director Labour and Overheads 60% Erection – 40%.

You are required to estimate the profit that could be taken to Profit and Loss Account against this partly completed contract as at 31.03.2001. (May, 2001,10 marks)

Answer

Estimation of Profit to be taken to Profit and Loss Account against partly completed contract as at 31.03.2001.

Profit to be taken to P/L Account = $\frac{2}{3}$ × Notional profit × $\frac{\text{Cash received}}{\text{Work certified}}$

(Refer to working notes 1,2,3 & 4)

= $\frac{2}{3}$ × Rs. 92.48 lakhs × $\frac{\text{Rs.}600 \text{ lakhs}}{\text{Rs.}642.48 \text{ lakhs}}$

= Rs.57.576 lakhs

Working Notes

1. Statement showing estimated profit to date and future profit on the completion of contract

Particulars	*Cost to date*		*Further Costs*		*Total Cost*
	% Completion to date	*Amount Rs. (a)*	*% comple-tion to be done*	*Amount Rs. (b)*	*Rs. (a) + (b)*
Fabrication costs:					
Direct material	70	280.00	30	120.00	400.00
Direct labour	60	100.00	40	66.67	166.67
Overheads	60	60.00	40	40.00	100.00
Total Fabrication cost (A)		440.00		226.67	666.67
Erection cost: (B)	40	110.00	60	165.00	275.00
Total estimated costs: (A+B)		550.00		391.67	491.67
Profit		92.48		65.85	158.33
(Refer to working note 2)		642.48		457.52	1,100.00

2. Profit to date (Notional Profit) and future profit are calculated as below:

Profit to date (Notional Profit) = $\frac{\text{Estimated profit on the whole contract} \times \text{Cost to date}}{\text{Total Cost}}$

= $\frac{\text{Rs.}158.33 \times \text{Rs.}550}{\text{Rs.}941.67}$

= Rs. 92.48 (lakhs)

Future Profit = Rs. 158.33 – Rs. 92.48

= Rs. 65.85

3. Work certified:

= Cost of the contract to date + Profit to date

= Rs. 550 + Rs. 92.49 = Rs. 642.48 lakhs

4. Degree of Completion of Contract to date:

$$= \frac{\text{Cost of the Contract to date}}{\text{Contract Price}} \times 100$$

$$= \frac{\text{Rs.642.48 lakhs}}{\text{Rs.1,100 lakhs}} \times 100$$

$$= 58.40\%$$

Question 15

One of the building contracts currently engaged in by a construction company commenced 15 months ago and remain unfinished . The following information relating to the work on the contract has been prepared for the year just ended:

	Rs.'000
Contract Price	*2,500*
Value of work certified at the end of year	*2,200*
Cost of work not yet certified at the end of year	*40*
Costs incurred:	
Opening balances:	
Case of work completed	*300*
Materials on site (physical stock)	*10*
During the year:	
Materials delivered to site	*610*
Wages	*580*
Hire of plant	*110*
Other expenses	*90*
Closing balance	
Materials on site (physical stock)	*20*

As soon as materials are delivered to the site, they are charged to the contract account. A record is also kept of materials as they are actually used on the contract. Periodically a stock check is maintained and any discrepancy between book stock and physical stock is transferred to a general contract material discrepancy account. This is absorbed back to each contract, currently at the rate of 0.5 of materials booked. The stock check at the year end revealed a stock shortage of Rs. 5,000.

In addition to the direct charges listed above, general overheads are charged to contract at 5% of the value of work certified. General overheads of Rs. 15,000 had been absorbed into the cost of work completed at the beginning of the year.

It has been estimated that further costs to complete the contract will be Rs. 2,20,000. this estimate includes the cost of materials on site at the end of the year finished and also a provision for rectification.

Required:

(a) Explain briefly the distinguishing features of contract costing. (Nov., 1995,4 marks)

(b) Determine the profitability of the above contract and recommend how much profit to nearest Rs.'000) should be taken for the year just ended. (Provide a detailed schedule of costs) (Nov., 1995, 9 marks)

(c) State how your recommendation in (b) would be affected if the contract price Rs. 40,00,000 (rather than rs. 25,00,000) and if no estimate has been made of costs to completion. (If required, suitable assumption should be made by the candidate).

(Nov. ,1995, 3 marks)

Answer

(a) Distinguishing features of contract costing

(i) *Higher proportion of direct costs:* Many costs which are normally classified as in direct can be traced specifically with a contract because of the self contained nature of most site operations thus they can be charged directly e.g. telephone installed at site, site power usage, site vehicles, transportation, wage bill (of site labour), supervisory staff salary, cost of the plant (exclusively purchased for a particular contract).

(ii) *Low indirect costs:* For most contracts the main item of indirect cost would be a charge for Head Office expenses. Other indirect costs include wages of workers which cannot be identified with a particular contract, or salary of supervisory staff looking two or more contracts.

(iii) *Difficulties of cost control:* Because of the scale of some contracts and the size of the site there are frequently major problems of cost control concerning: material usage and losses, pilferage, labour supervision and utilization, damage to and loss of plant and tools.

(iv) *Surplus materials:* All materials bought for a contract would be charged directly to the contract. At the end of the contract, the contract account would be credited with the cost of materials not used, and if they were transferred directly to another contract, the new contract account would be debited. If they were not required immediately, the materials would be stored and the cost debited to a stock account.

(b) Detailed schedule of Costs and Profitability

	Rs.'000
Cost of work completed	300
(Opening balance)	
Materials	595
(Refer to Working note 1)	
Wages	580
Hire of plant	110
Other expenses	90
Stock discrepancy (0.5% of Rs. 595)	3
General overhead (5% × Rs. 2,200 – Rs. 15)	95
Cost of contract to date	1,773
Add: Further costs to complete the contract	220
Estimated total cost: (A)	1,993
Contract price (B)	2,500
Estimated Profit (B-A)	507

Profit to be taken to Costing P/L A/c

$$= \frac{\text{Estimated profit} \times \text{cost of work to date}}{\text{Estimated total cost}}$$

$$= \frac{\text{Rs.}5,07,000 \times \text{Rs.}17,73,000}{\text{Rs.}19,93,000}$$

= Rs. 4,51,034

Note: For calculating the profit to be taken to Costing P/L Account, other methods can also be used.

Working note:

Cost of material booked/utilised (at site)	*Rs.*
Material delivered to site	6,10,000
Add: Opening balance of material at site	10,000
	6,20,000

Less: Closing balance of material at site	20,000
	6,00,000
Less: Stock shortage	5,000
Material booked (at site)	5,95,000

(c) When the value of contract becomes Rs. 40,00,000 and the value of work certified is Rs.22,00,000 than contract's completion percentage comes out to be more than 50%. Hence the amount of profit to be taken to Costing Profit and Loss Account comes to: (if the ratio of cash received/work certified is 80%).

$$= \frac{2}{3} \text{ Notional Profit} \times \frac{\text{Cash received}}{\text{Work certified}}$$

$$= \frac{2}{3} \times \text{Rs. } 4,67,000^* \times \frac{80}{100}$$

= Rs. 2,49,067 (rounded to Rs. 2,49,000)

*Notional Profit

= {Value of work certified + Cost of work not certified – Cost of contract to date}

= {Rs. 22,00,000 + Rs. 40,000 – Rs. 17,73,000}

= Rs. 4,67,000

Question 16

A contractor commenced a building contract on October 1, 1997. The contract price is Rs. 4,40,000. The following data pertaining to the contract for the year 1998-99 has been compiled from his books and is as under:

		Rs.
April, 1998	*Work-in-progress not certified*	*55,000*
	Materials at site	*2,000*
1998 – 99	*Expenses incurred:*	
	Materials issued	*1,12,000*
	Wages paid	*1,08,000*
	Hire of plant	*20,000*
	Other expenses	*34,000*
March 31, 1999	*Materials at site*	*4,000*
	Work-in-progress: Not certified	*8,000*
	Work-in-progress: Certified	*4,05,000*

The cash received represents 80% of work certified. It has been estimated that further costs to complete the contract will be Rs.23,000 including the materials at site as on March 31, 1999.

Required

Determine the profit on the contract for the year 1998-99 on prudent basis, which has to be credited to P/L A/c.

Answers

Contract Account
For the year 1998-99

Dr.			*Cr.*
Particulars	*Rs.*	*Particulars*	*Rs.*
01.04.98			
To Work in-progress (not certified)	55,000	By Materials at site	4,000
To Materials at site	2,000		
1998-99			
To Materials issued	1,12,000	By Cost of contract	3,27,000
To Wages paid	1,08,000	c/d (to date)	
To Hire of plant	20,000		
To Other expenses	24,000		
	3,31,000		3,31,000
31.03.99			
To Cost of contract b/d (to date)	3,27,000	By Work-certified	4,05,000
To Profit & Loss A/c	66,273	By Work-not certified	8,000
To Profit in reserve	19,727		
	4,13,000		4,13,000

Profit for the year 1998–99

= Rs. 4,13,000 – Rs. 3,27,000 = Rs. 86,000

Estimated profit (on the completion of the contract)

	Rs.
Cost of the contract (to date)	3,27,000
Further cost of completing	23,000
the contract	
Total cost : (A)	3,50,000
Contract price: (B)	4,40,000
Estimated profit on the	
Completion of contract: [(A)–(B))	90,000

$$\text{Since } \left(\frac{\text{Work certified}}{\text{Contract price}}\right) \times 100 = \frac{\text{Rs.4,05,000}}{\text{Rs.4,40,000}} \times 100 = 92.05\%$$

This implies that contract is nearing completing. Hence the profit to be taken to Profit and Loss Account on prudent basis will be given by the formula:

$$= \text{Estimated profit} \times \frac{\text{Work certified}}{\text{Contract price}} \times \frac{\text{Cash received}}{\text{Work certified}}$$

$$= \text{Rs. } 90{,}000 \times \frac{\text{Rs.4,05,000}}{\text{Rs.4,40,000}} \times \frac{\text{Rs.3,24,000}}{\text{Rs.4,05,000}}$$

= Rs. 66,273

Question 17

A construction company undertook a contract at an estimated price of Rs.108 lacs, which includes a budgeted profit of Rs. 18 lacs. The relevant data for the year ended 31.03.2002 are as under:

	(Rs. '000)
Materials issued to site	*5,000*
Direct wages paid	*3,800*
Plant hired	*700*
Site office costs	*270*
Materials returned from site	*100*
Direct expenses	*500*
Work certified	*10,000*
Progress payment received	*7,200*

A special plant was purchased specifically for this contract at Rs. 8,00,000 and after use on this contract till the end of 31.02.2002, it was valued at Rs.5,00,000. This cost of materials at site at the end of the year was estimated at Rs. 18,00,000. Direct wages accrued as on 31.03.2002 was Rs. 1,10,000.

Required

Prepare the Contract Account for the year ended 31st March, 2002 and compute the profit to be taken to the Profit and Loss account. *(Nov. 2002, 6 marks)*

Answer

Contract Account for the year ended 31st March, 2002

Dr.			*Cr.*
	Rs. '000		*Rs. '000*
To Materials issued to site	5,000	By Materials at site	1,800
To Direct wages	3,800	By Materials returned	100
To Wages accrued	110	By Cost of contract	8,780
To Plant hire	700		
To Site Office Costs	270		
To Direct expenses	500		
To Depreciation of special plant	300		
	10,680		10,680
To Cost of contract	8,780	By Work certified	10,000
To Profit & Loss A/c	1,200		
(Refer to working note 2)			
To Work-in-progress c/d	20		
(Profit in reserve)	10,000		10,000

Working notes

1. **Percentage of contract completion** $= \frac{\text{Cost of work certified}}{\text{Value of the contract}} \times 100$

$= \frac{100 \text{ lacs}}{108 \text{ lacs}} \times 100 = 92.59\%$

2. **Since the percentage of Contract completion is more than 90% therefore the profit to be taken to Profit and Loss Account can be computed by using the following formula.**

Profit to be taken to P & L A/c = Budged/Estimated Profit $\times \frac{\text{Cash received}}{\text{Work certified}} \times \frac{\text{Work certified}}{\text{Contract price}}$

$$= 1{,}800 \times \frac{7{,}200}{10{,}000} \times \frac{10{,}000}{10{,}800}$$

$$= 1,800 \times \frac{7,200}{10,800}$$

$$= \text{Rs. } 1,200$$

Question 18

MNP Construction Ltd. commenced a contract on April 1,1999. The total contract was for Rs. 17,50,000. It was decided to estimate the total profit and to take to the credit of P/L A/c the proportion of estimated profit on cash basis, which work completed bore to the total contract. Actual expenditure in 1999-2000 and estimated expenditure in 2000-2001 are given below:

		1999-2000 (Actuals) Rs.	*2000-2001 (Estimated) Rs.*
Materials issued		*3,00,000*	*5,50,000*
Labour	*: Paid*	*2,00,000*	*2,50,000*
	: Outstanding at end	*20,000*	*30,000*
Plant purchased		*1,50,000*	*–*
Expenses	*: Paid*	*75,000*	*1,50,000*
	: Prepaid at end	*15,000*	*—*
Plant returned to store (historical cost)		*50,000*	*1,00,000 (On Dec. 31, 2000)*
Material at site		*20,000*	*50,000*
Work certified		*8,00,000*	*Full*
Work uncertified		*25,000*	*—*
Cash received		*6,00,000*	*Full*

The plant is subject to annual depreciation @ 25% of WDV Cost. The contract is likely to be completed on Dec. 31, 2000. Prepare the Contract A/c Determine the profit on the contract for the year 1999-2000 on prudent basis, which has to be credited to P/L A/c.

Answer

MNP Construction Ltd.
Contract Account (1st April, 1999 to 31st March, 2000)

Dr.				*Cr.*
Particulars	*(Rs.)*	*Amount (Rs.)*	*Particulars*	*Amount (Rs.)*
To Materials issued		3,00,000	By Plant returned to store	37,500
To Labour : Paid	2,00,000		*(Refer to working note 1)*	
Outstanding	20,000	2,20,000	By Materials at site	20,000
To Plant purchased		1,50,000	By Work certified	8,00,000
(Refer to working note 4)			By Work uncertified	25,000
To Expenses		60,000	By Plant at site	75,000

To Notional profit c/d	2,27,500	*(Refer to working note 2)*	
	9,57,500		9,57,500
To Profit and Loss A/c	66,321.43	By Notional profit b/d	2,27,500
(Refer to working note 5)			
To Work in Progress A/c	1,61,178.57		
(Profit in reserve)			
	2,27,500.00		2,27,500.00

MNP Construction Ltd.
Contract Account (1st April, 1999 to 31st December, 2000)
(For computing estimated profit)

Dr. *Cr.*

Particulars	*Amount Rs.*	*Particulars*	*Amount Rs.*
To Material issued	8,50,000	By materials at site	50,000
(Rs. 3,00,000 + Rs. 5,50,000)		By Plant returned to store	37,500
To Labour (Paid and outstanding)	4,80,000	on 31st March 2000	
(Rs.2,20,000 + Rs. 2,30,000 +		*(Refer to working note 1)*	
Rs. 30,000)		By Plant returned to store	60,937.50
To Plant purchased	1,50,000	on 31st December, 2000	
To Expenses	2,25,000	*(Refer to working note 3)*	
(Rs. 60,000 + Rs. 1,65,000)			
To Estimated profit	1,93,437.50	By Contractee's A/c	17,50,000
	18,98,437.50		18,98,437.50

Working notes:

1. *Value of the plant returned to store on 31st March, 2000*

	Rs.
Historical cost of the plant returned	50,000
Less: Depreciation @ 25% of WDV cost for 1 year	12,500
Value of the plant returned to store on 31st March, 2000	37,500

2. *Value of plant at site*

	Rs.
Historical cost of the plant at site	1,00,000
Less: Depreciation @ 25% of WDV cost for 1 year	25,000
Value of the plant returned at site on 31st March, 2000	75,000

3. *Value of the plant returned to store on 31st December, 2000*

	Rs.
Value of the plant on 31st March, 2000	75,000
Less: Depreciation @ 25% of WDV for a period of 9 months	14,062.50
Value of the plant on 31-12-2000	60,937.50

4. *Expenses paid*

Total expenses paid	75,000
Less: Prepaid expenses at end	15,000
Expenses paid for the year 1999-2000	60,000

5. *Profit to be credited to P/L A/c on 31st March, 2000 for the contract likely to be completed on 31st December 2000*

$$\text{Estimated profit} \times \frac{\text{Cash received}}{\text{Work certified}} \times \frac{\text{Work certified}}{\text{Total contract price}}$$

$$= \text{Rs. } 1,93,437.50 \times \frac{\text{Rs.}6,00,000}{\text{Rs.}8,00,000} \times \frac{\text{Rs.}8,00,000}{\text{Rs.}17,50,000}$$

$$= \text{Rs. } 66,321.43$$

Question 19

A construction company under-taking a number of contracts, furnished the following data relating to its uncompleted contracts as on 31st March, 1996.

	(Rs. In Lacs) *Contract Numbers*			
	723	*726*	*729*	*731*
Total Contract Price	*23.20*	*14.40*	*10.08*	*28.80*
Estimated Costs on completion of Contract	*20.50*	*11.52*	*12.60*	*21.60*
Expenses for the year ended 31.03.96				
Direct Materials	*5.22*	*1.80*	*1.98*	*0.80*
Direct wages	*2.32*	*4.32*	*3.90*	*2.16*
Overheads (Excluding Depreciation)	*1.06*	*2.60*	*2.62*	*1.05*
Profit Reserve as on 01.04.95	*1.50*	—	—	—
Plant issued at Cost	*5.00*	*3.50*	*2.75*	*3.00*
Material at Site on 01.04.95	*0.75*	—	—	—
Materials at Site on 31.03.96	*0.45*	*0.20*	*0.08*	*0.05*
Work Certified till 31.3.95	*4.65*	—	—	—
Work Certified during the year 1995-96	*12.76*	*13.26*	*7.56*	*4.32*
Work Uncertified as on 31.03.96	*0.84*	*0.24*	*0.14*	*0.18*
Progress payment received during the year	*9.57*	*9.00*	*5.75*	*3.60*

Depreciation @ 20% per annum is to be charged on plant issued. While the Contract No. 723 was carried over from last year, the remaining contracts were started in the 1st week of April, 1995, required.

(i) Determine the profit/loss in respect of each contract for the year ended 31st March, 1996.

(ii) State the profit/loss to be carried to Profit & Loss A/c for the year ended 31st March, 1996

(Nov., 1996, 12 marks)

Answer

(i) Statement of Profit / Loss in respect of following contract numbers for the year ended 31st March, 1996

(Rs. In Lacs)

		Contract Numbers			
		723	726	729	731
A.	*Contract completion percentage:*				
	Work Certified (a)	17.41	13.26	7.56	4.32
	Contract price (b)	23.20	14.40	10.08	28.80
	Percentage of completion [(a)-(b)]	75.04	92.08	75.00	15.00
B.	*Estimated profit on completion:*				
	Contract Price (c)	23.20	14.4	10.08	28.80
	Estimated costs on completion : (d)	20.50	11.52	12.60	21.60
	Estimated profit (Loss) on Completion [(c)-(d)]	2.70	2.88	(2.52)	7.20
C.	*Profit of the year*				
	Op. stock of materials	0.75	—	—	—
	Materials issued	5.22	1.80	1.98	0.80
	Direct wages	2.32	4.32	3.90	2.16
	Overheads	1.06	2.60	2.62	1.05
	Depreciation	1.00	0.70	0.55	0.60
	Total : (P)	10.35	9.42	9.05	4.61
	Profit in reserve	1.50	—	—	—
	Material at site on 31.03.96	0.45	0.20	0.08	0.05
	Total (Q)	1.95	0.20	0.08	0.05
	Cost of contract (R) = [(P) – (Q)]	8.40	9.22	8.97	4.56
	Work certified	12.76	13.26	7.56	4.32
	Work not certified	0.84	0.24	0.14	0.18
	Total : (S)	13.60	13.50	7.70	4.50
	Profit (loss for the year [(R) – (S)]	5.20	4.28	(1.27)	(0.06)

(ii) Profit to be taken to Profit & Loss Account of the year in respect of respective contract

Contract 723 = $\frac{2}{3}$ × Notional profit × $\frac{\text{Cash received}}{\text{Work certified}}$

= $\frac{2}{3}$ × 5.20 × $\frac{9.57}{12.76}$ = Rs. 2.60 lacs.

= Balance Rs. 2.60 lacs to reserve

Contract 726 = $\frac{\text{Estimated total profits}}{\text{on completion}}$ × $\frac{\text{Work certified}}{\text{Contract price}}$ × $\frac{\text{Cash received}}{\text{Work certified}}$

= 2.88 × $\frac{13.26}{14.40}$ × $\frac{9.00}{13.26}$ = Rs. 1.80 lacs.

= Balance to reserve.

= Rs. 2.48 lacs.

Contract 729 = Provide for current loss of Rs. 1.27 lacs.

= Provide for expected loss of Rs. 1.25 lacs.

Contract 731 = Provide for current loss of Rs. 0.06 lacs

Question 20

A company undertook a contract for construction of a large building complex. The construction work commenced on 1st April 1993 and the following data are available for the year ended 31st March 1994.

	Rs. '000
Contract Price	*35,000*
Work certified	*20,000*
Progress Payments Received	*15,000*
Materials Issued to Site	*7,500*
Planning & Estimating costs	*1,000*
Direct Wages Paid	*4,000*
Materials Returned From Site	*250*
Plant Hire Charges	*1,750*
Wage Related Costs	*500*
Site Office Costs	*678*
Head Office Expenses Apportioned	*375*
Direct Expenses Incurred	*902*
Work Not Certified	*149*

The contractors own a plant which originally cost Rs.20 lacs has been continuously in use in this contract throughout the year. The residual value of the plant after 5 years of life is expected to be Rs. 5 lacs. Straight line method of depreciation is in use.

As on 31st March, 1994 the direct wages due and payable amounted to Rs. 2,70,000 and the materials at site were estimated at Rs. 2,00,000.

Required:

(i) Prepare the contract account for the year ended 31st March, 1994.

(ii) Show the calculation of profit to be taken to the profit and loss account of the year.

(iii) Show the relevant balance sheet entries (Nov., 1994, 16 marks)

Answer

(i) Contract Account for the year ended 31st March, 1994

Dr.			Cr.
	Rs.'000		*Rs.'000*
To Materials issued	7,500	By Materials returned	250
To Direct wages paid	4,000	By Materials at site	200
To Direct wages accrued	270	By Work-in-progress c/d	
To Wage related costs	500	Work certified	20,000
To Direct expenses incurred	902	Work uncertified	149
To Plant hire charges	1,750		
To Planning and estimating cost	1,000		
To Site Office costs	678		
To Head Office expenses apportioned	375		
To Plant depreciation *(Refer to Working Note1)*	300		
To Notional Profit	3,324		
	20,599		20,599
To Profit and Loss A/c *[See Ans (ii) below]*	1,662	By Notional profit b/d	3,324
To Work-in-progress c/d *(Profit in reserve)*	1,662		
	3,324		3,324

01.04.94			
To Work in-progress b/d		By Work in-progress b/d	1,662
Work certified	20,000	*(Profit in reserve)*	
Work uncertified	149		
To Materials at site	200		

(ii) *Profit to be transferred to Profit and Loss Account (Fig. In Rs.'000)*

Since the Contract is between 50% and 90% completion, therefore, two-third of the notional profit, reduced by the proportion of cash received to work certified is to be transferred to profit and loss account as shown below:

$$= \frac{2}{3} \times \text{Notional Profit} \times \frac{\text{Cash Received}}{\text{Work Certified}}$$

$$= \frac{2}{3} \text{ Rs. } 3{,}324 \times \frac{\text{Rs.}15{,}000}{\text{Rs.}20{,}000} = \text{Rs. } 1{,}662$$

(iii) Balance Sheet (extract) as on 31st March, 1994

Liabilities	*Rs.'000*	*Assets*	*Rs.'000*
Profit and Loss A/c	1,662	Plant at site	1,700
		(Rs. 2,000 – Rs. 300)	
Wages accrued	270	Materials at site	200
		Work-in-progress	3,487
		(Refer to Working Note 2)	

Working notes

		Rs. '000
1.	**Plant depreciation**	
	Original cost of Plant	2,000
	Less: Residual value	500
	Cost of plant used	1,500
	Life of plant : 5 years	
	Annual Depreciation (Rs. 1,500/5)	300
2.	**Work in-Progress**	20,149
	Less: Profit in reserve	1,662
	Difference	18,487
	Less: Cash received	15,000
	Net WIP	3,487

Question 21

Compute a conservative estimate of profit on a contract (which has been 80% complete) from the following particulars. Illustrate four methods of computing the profit:

	Rs.
Total expenditure to date	*1,70,000*
Estimated further expenditure to complete the contract (including contingencies)	*34,000*
Contract Price	*3,06,000*
Work Certified	*2,00,000*
Work not certified	*17,000*
Cash Received	*1,63,200*

(May, 1998, 8 marks)

Answer

Working Notes

1. *Computation of estimated profit*	*Rs.*	*Rs.*
Contract price		3,06,000
Less: Total expenditure to date	1,70,000	
Less: Estimated further expenditure to complete the contract (including contingencies)	34,000	2,04,000
Estimated profit		1,02,000
2. *Computation of Notional Profit*		
Value of work certified		2,00,000
Less: Cost of work certified:		1,53,000
(Total expenditure to date – work not certified)		
(Rs. 1,70,000 – Rs. 17,000)		
Notional Profit		47,000

Four methods of computing the conservative estimates of profits (when 89% of the contract is complete)

(i) Estimated profit × $\frac{\text{Work Certified}}{\text{Contract price}}$ (Refer to working note 1)

= Rs. 1,02,000 × $\frac{\text{Rs.2,00,000}}{\text{Rs.3,06,000}}$ = Rs. 66,666.66

(ii) Estimated profit × $\frac{\text{Work certified}}{\text{Contract price}} \times \frac{\text{Cash received}}{\text{Work certified}}$

= Rs. 1,02,000 × $\frac{\text{Rs.2,00,000}}{\text{Rs.3,06,000}} \times \frac{\text{Rs.1,63,2000}}{\text{Rs.2,00,000}}$

= Rs. 54,400

(iii) Notional profit × $\frac{\text{Work certified}}{\text{Contract price}}$ (Refer to working note 2)

= Rs. 47,000 × $\frac{\text{Rs.2,00,000}}{\text{Rs.3,06,000}}$ = Rs. 30,718.95

(iv) $\frac{2}{3}$ × Notional Profit × $\frac{\text{Cash received}}{\text{Work certified}}$

= $\frac{2}{3}$ × Rs. 47,000 × $\frac{\text{Rs.1,63,200}}{\text{Rs.2,00,000}}$

= Rs. 25.568

Question 22

Explain escalation Clause.

Answer

Escalation clause

It is a clause which is always provided in a contract to safeguard the interests of the contractor against any rise in price of materials and rates of labour and their increased utilization. If the prices of materials and rates of labour increases during the period of the contract beyond a certain defined level, the contractor will be compensated to the extent of a portion thereof. The contractor has to satisfy the contractee about his claim for compensation in respect of prices and utilisation of material and labour.

Question 23

RST Construction Limited commenced a contract on April 1, 2005. The total contract was for Rs. 49,21,875. It was decided to estimate the total Profit on the contract and to take to the Credit of Profit and Loss Account that proportion of estimated profit on cash basis, which work completed bore to total Contract. Actual expenditure for the period April 1, 2005 to March 31, 2006 and estimated expenditure for April 1, 2006 to September 30, 2006 are given below:

	April 1, 2005 to March 31, 2006 (Actuals)	*April 1, 2006 to September 30, 2006 (Estimated)*
	Rs.	*Rs.*
Materials Issued	*7,76,250*	*12,99,375*
Labour: Paid	*5,17,500*	*6,18,750*

: Prepaid	*37,500*	*—*
: Outstanding	*12,500*	*5,750*
Plant Purchased	*4,00,000*	*—*
Expenses: Paid	*2,25,000*	*3,75,000*
: Outstanding	*25,000*	*10,000*
: Prepaid	*15,000*	*—*
Plant returns to Store (historical cost)	*1,00,000*	*3,00,000*
	(On September 30, 2005)	*(On September 30, 2006)*
Work certified	*22,50,000*	*Full*
Work uncertified	*25,000*	*—*
Cash received	*18,75,000*	*—*
Materials at site	*82,500*	*42,500*

The plant is subject to annual depreciation @ 25% on written down value method. The contract is likely to be completed on September 30, 2006.

Required:

Prepare the contract A/c. Determine the profit on the contract for the year 2005-06 on prudent basis, which has to be credited to Profit and Loss Account.. (10 Marks)

Answer

Contract Account for the year ending March 31, 2006

			Rs.				*Rs.*
To	Materials issued		7,76,250	By	Work-in-progress		
To	Labour	5,17,500			Certified	22,50,000	
	Add: Outstanding	12,500			Uncertified	25,000	22,75,000
	Less: Prepaid	37,500	4,92,500	By	Plant returned to store		
To	Plant		4,00,000		on 30.09.2005		
To	Expenses	2,25,000			(1,00,000 – 25% × ½)		87,500
	Add: Outstanding	25,000		By	Plant at site		
	Less: Prepaid	15,000	2,35,000		(3,00,000 – 25%)		2,25,000
				By	Materials at site		82,500
To	Notional Profit c/d		7,66,250				
			26,70,000				26,70,000
To	Profit and Loss A/c			By	Notional Profit b/d		7,66,250
	$10,21,125 \times \frac{22,50,000}{49,21,875} \times \frac{18,75,000}{22,50,000}$		3,89,000				
To	WIP (Reserve)		3,77,250				
			7,66,250				7,66,250

Contract Account (for entire life period April 1, 2005 to September 30, 2006)

		Rs.				Rs.
To	Materials issued		By	Contractee A/c		49,21,875
	(7,76,250 + 12,99,375)	20,75,625	By	Materials at site		42,500
To	Labour (5,17,500 − 37,500 + 12,500 + 6,18,750 + 37,500 – 12,500 + 5,750)	11,42,000	By	Plant returned on September 30, 2005 (1,00,000 – 12,500)		87,500
To	Plant	4,00,000	By	Plant returned on		
To	Expenses	6,10,000		September 30, 2006	3,00,000	
	(2,25,000 + 25,000 – 15,000 + 3,75,000 – 25,000 + 15,000 + 10,000)			Depreciation for 2005-2006 @ 25%	75,000 2,25,000	
To	Estimated profit on contract	10,21,125		Depreciation 2006-2007(1/2)	28,125	1,96,875
		52,48,750				52,48,750

Question 24

Explain the following:

(i) Notional profit in Contract costing

(ii) Retention money in Contract costing *(May 2007, 2, 2 Marks)*

Answer

(i) Notional profit in Contract costing:

It represents the difference between the value of work certified and cost of work certified.

Notional Profit = Value of work certified – (Cost of works to date – Cost of work not yet certified)

(ii) Retention Money in Contract Costing:

A contractor does not receive the full payment of the work certified by the surveyor. Contractee retains some amount to be paid after some time, when it is ensured that there is no default in the work done by the contractor. If any deficiency or defect is noticed, it is to be rectified by the contractor before the release of the retention money. Thus, the retention money provides a safeguard against the default risk in the contracts.

Question 25

Modern Construction Ltd. obtained a contract No. B-37 for Rs. 40 lakhs. The following balances and information relate to the contract for the year ended 31st March, 2008:

	1.4.2007	*31.3.2008*
	Rs.	*Rs.*
• *Work-in-progress:*		
• *Work certified*	*9,40,000*	*30,00,000*

• *Work uncertified*	*11,200*	*32,000*
• *Materials at site*	*8,000*	*20,000*
• *Accrued wages*	*5,000*	*3,000*

Additional information relating to the year 2007-2008 are:

	Rs.
• *Materials issued from store*	*4,00,000*
• *Materials directly purchased*	*1,50,000*
• *Wages paid*	*6,00,000*
• *Architect's fees*	*51,000*
• *Plant hire charges*	*50,000*
• *Indirect expenses*	*10,000*
• *Share of general overheads for B-37*	*18,000*
• *Materials returned to store*	*25,000*
• *Materials returned to supplier*	*15,000*
• *Fines and penalties paid*	*12,000*

The contractee pays 80% of work certified in cash. You are required to prepare:

(i) Contract Account showing clearly the amount of profits transferred to Profit and Loss Account.

(ii) Contractee's Account.

(iii) Balance Sheet . (May 2007, 4 Marks)

Answer

Books of Modern Constructions Ltd.

Contract No. B-37 Account for the year ended 31st March, 2008

		Rs.			*Rs.*
To	WIP b/d (9,40,000 + 11,200)	9,51,200	By	Wages Accrued b/d	5,000
To	Stock (materials) b/d	8,000	By	Materials returned to Store	25,000
To	Materials issued	4,00,000	By	Materials returned to suppliers	15,000
To	Materials purchased	1,50,000	By	WIP c/d -	
To	Wages paid	6,00,000		Work	

				Certified	30,00,000	
To	Wages Accrued c/d	3,000		Uncertified work	32,000	30,32,000
To	Architect's fees	51,000	By	Materials stock c/d		20,000
To	Plant Hire charges	50,000				
To	Indirect expenses	10,000				
To	General overheads	18,000				
To	Notional profit c/d	8,55,800				
		30,97,000				30,97,000
To	Profit and Loss A/c		By	Notional Profit b/f		8,55,800
	$\left(\frac{2}{3}\times 8,55,800\times\frac{80}{100}\right)$	4,56,427				
To	WIP Reserve c/d	3,99,373				
		8,55,800				8,55,800

Note:

Fines and penalties are not shown in contract accounts.

Contractee's Account

		Rs.			*Rs.*
To	Balance c/d	24,00,000	By	Balance b/d (80% of 9,40,000)	7,52,000
			By	Bank	16,48,000
		24,00,000			24,00,000

Balance Sheet (Extract) as on 31.3.2008

	Rs.				*Rs.*
Profit and Loss A/c	4,56,427		Materials stock at site		20,000
Less: Fines	12,000	4,44,427	Materials stock in store		25,000
Outstanding wages		3,000	WIP:		
			Work Certified	30,00,000	
			Work Uncertified	32,000	
				30,32,000	
			Less: Advance	24,00,000	
				6,32,000	
			Less: WIP Reserve	3,99,373	2,32,627

Question 26

Compute a conservative estimate of profit on contract (which has been 90% complete) from the following particulars:

	Rs.
Total expenditure to date	22,50,000
Estimated further expenditure to complete the contract (including contingencies)	2,50,000
Contract Price	32,50,000
Work certified	27,50,000
Work uncertified	1,75,000
Cash received	21,25,000

(*Nov, 2007, 6 marks)*

Answer

The contract is 90% complete, the method used for transfer of profit to Profit and Loss Account for the current year will be on the basis of estimated profit on completed contract basis.

$$\text{Credit to Proift and Loss Account} = \text{Estimated profit on completed contract} \times \frac{\text{Work certified}}{\text{Contract price}} \times \frac{\text{Cash received}}{\text{Work certified}}$$

Estimated profit on completed contract basis = Contract Price – (Total expenditure to date + Estimated further expenditure to completed contract)

= 32,50,000 – (22,50,000 + 2,50,000)

= Rs. 7,50,000.

$$\text{Credit to Proift and Loss Account} = 7,50,000 \times \frac{27,50,000}{32,50,000} \times \frac{21,25,000}{27,50,000} = \text{Rs. } 4,90,385$$

Question 27

What is cost plus contract? State its advantages. *(November 2008, 3 Marks)*

Answer

Cost plus contract: Under cost plus contract, the contract price is ascertained by adding a percentage of profit to the total cost of the work. Such types of contracts are entered into when it is not possible to estimate the contract cost with reasonable accuracy due to unstable condition of material, labour services etc.

Following are the advantages of cost plus contract:

(i) The contractor is assured of a fixed percentage of profit. There is no risk of incurring any loss on the contract.

(ii) It is useful specially when the work to be done is not definitely fixed at the time of making the estimate.

(iii) Contractee can ensure himself about the 'cost of contract' as he is empowered to examine the books and documents of the contractor to ascertain the veracity of the cost of contract.

9
Operating Costing

Question 1

Distinguish between Operating Costing and Operation Costing.

Answer

Operating Costing: It is a method of costing applied by undertakings which provide service rather than production of commodities. Like unit costing and process costing, operating costing is thus a form of operation costing.

The emphasis under operating costing is on the ascertainment of cost of rendering services rather than on the cost of manufacturing a product. It is applied by transport companies, gas and water works, electricity supply companies, canteens, hospitals, theatres, school etc. Within an organisation itself certain departments too are known as service departments which provide ancillary services to the production departments. For example, maintenance department; power house; boiler house; canteen; hospital; internal transport.

Operation Costing: It represent a refinement of process costing. In this each operation instead of each process of stage of production is separately costed. This may offer better scope for control. At the end of each operation, the unit operation cost may be computed by dividing the total operation cost by total output.

Question 2

(a) What do you understand by Operating Costs? Describe its essential features and state where it can be usefully implemented.

(b) A chemical factory runs its boiler on furnace oil obtained from Indian Oil and Bharat Petroleum, whose depots are situated at a distance of 12 and 8 miles from the factory site. Transportation of Furnace Oil is made by the Company's own tank lorries of 5 tons capacity each. Onward trips are made only on full load and the lorries return empty. The filling-in time takes an average 40 minutes for Indian Oil and 30 minutes for Bharat Petroleum. But the emptying time in the factory is only 40 minutes for all. From the record available it is seen that the average speed of the company's lorries works out to 24 miles per hour. The varying operating charges average 60 paise per mile covered and fixed charges give an incidence of Rs. 7.50 per hour of operation. Calculate the cost per ton mile for each source.

Answer

Operating Costs are the costs incurred by undertakings which do not manufacture any product but provide a service. Such undertakings for example are — Transport concerns, Gas agencies; Electricity Undertakings; Hospitals; Theatres etc. Because of the varied nature of activities carried out by the service undertakings, the cost system used is obviously different from that followed in manufacturing concerns.

The essential features of operating costs are as follows:

(1) The operating costs can be classified under three categories. For example in the case of transport undertaking these three categories are as follows:

(a) *Operating and running charges.* It includes expenses of variable nature. For example expenses on petrol, diesel, lubricating oil, and grease etc.

(b) *Maintenance charges.* These expenses are of semi-variable nature and includes the cost of tyres and tubes, repairs and maintenance, spares and accessories, overhaul, etc.

(c) *Fixed or standing charges.* These includes garage rent, insurance, road licence, depreciation, interest on capital, salary of operating manager, etc.

(2) The cost unit used is a double unit like passenger-mile; Kilowatt-hour, etc.

It can be implemented in all firms of transport, airlines, bus-service, etc., and by all firms of Distribution Undertakings.

Statement showing the cost per ton mile of carrying furnace oil from Indian Oil and Bharat Petroleum Depots to Chemical Factory

	Indian Oil	*Bharat Petroleum*
	Rs.	*Rs.*
Variable Cost of Operating *(See working note I)*	14.40	9.60
Fixed Charges *(See working note 2)*	17.50	9.60
Total Cost	31.90	23.35
Cost per ton-mile	53 paise (Approx.)	58.00 paise (Approx)

Working Notes

	Indian Oil	*Bharat Petroleum*
1. Distance of Oil Depots from Chemical Factory:	12 miles	8 miles
Mileage covered under one trip by a lorry	24 miles	16 miles
Variable cost of operating @ 60 paise per mile	Rs. 14.40	Rs. 9.60

2.	Running time of lorries at a speed of 24 m.p.h.	60 minutes	40 minutes
	Filling in time	40 minutes	30 minutes
	Emptying time	40 minutes	30 minutes
	Total time	140 minutes	140 minutes
	Fixed charges @ Rs. 7.50 per hour	Rs. 17.50	Rs. 13.75
3.	Load carried by tank lorries	5 tones	5 tones
	Total effective tons-mile	60 (12 miles × 5 tons)	40 (8 miles × 5 tons)

$$\text{Cost per ton mile} = \frac{\text{Total Cost}}{\text{Total effective tons miles}}$$

In the case of Indian Oil

$$\text{Cost per ton mile} = \frac{\text{Rs. } 31.90}{60} = 53.17 \text{ Paise}$$

Similarly, in the case of the Bharat Petroleum

$$\text{Cost per ton-mile} = \frac{\text{Rs. } 23.35}{40} = 58.38 \text{ Paise}$$

Question 3

Write short note on operation costing. *(May, 1996, 4 marks)*

Answer

Operation Costing: It is defined as the refinement of process costing. It is concerned with the determination of the cost of each operation rather than the process. In those industries where a process consists of distinct operations, the method of costing applied or used is called operation costing. Operation costing offers better scope for control. It facilitate the computation of unit operation cost at the end of each operation by dividing the total operation cost by total input units. It is the category of the basic costing method, applicable, where standardized goods or services result from a sequence of repetitive and more or less continuous operations, or processes to which costs are charged before being averaged over the units produced during the period. The two costing methods included under this head are process costing and service costing.

Question 4

SMC is a public school having five buses each plying in different directions for the transport of its school students. In view of a large number of students availing of the bus service, the buses work two shifts daily both in the morning and in the afternoon. The buses are garaged in the school. The work-load of the students has been so arranged that in the morning the first trip picks up the senior students and the second trip plying an hour later picks

up the junior students. Similarly in the afternoon the first trip drops the junior students and an hour later the second trip takes the senior students home.

The distance travelled by each bus one way in 8 kms. The school works 25 days in a month and remains closed for vacation in May, June and December. Bus fee, however, is payable by the students for all the 12 months of the year.

The details of expenses for a year are as under:

Driver's salary	*Rs.*	*450 per month per driver*
Cleaner's salary	*Rs.*	*350 per month*
(Salary payable for 12 months)		
(One cleaner employed for all the five buses)		
License fee, taxes etc.	*Rs.*	*860 per bus per annum*
Insurance	*Rs.*	*1,000 per bus per annum*
Repairs & Maintenance	*Rs.*	*3,500 per bus per annum*
Purchase price of bus	*Rs.*	*1,50,000 each*
(Life 12 years)		
Scrap value	*Rs.*	*30,000*
Diesel cost	*Rs.*	*2.00 per litre.*

Each bus gives an average mileage of 4 kms per litre of diesel.

Seating capacity of each bus is 50 students.

The seating capacity is fully occupied during the whole year.

Students picked up and dropped within a range upto 4 kms. of distance from the school are charged half fare and fifty percent of the students travelling in each trip are in this category. Ignore interest. Since the charges are to be based on average cost, you are required to:

(i) Prepare a statement showing the expenses of operating a single bus and the fleet of five buses for a year.

(ii) Work out the average cost per student per month in respect of

(A) Students coming from a distance of upto 4 kms. from the school and

(B) Students coming from a distance beyond 4 kms. from the school

Answer

SMC Public School

Operating Cost Statement

Particulars	*Rate*	*Per Bus Per Annum*		*Fleet of 5 buses p.a.*	
		No.	*Rs.*	*No.*	*Rs.*
Driver's salary	450 p.m.	1	5,400	5	27,000
Cleaner's salary	350 p.m.	1/5	840	1	4,200

Licence fee, taxes etc.	860 p.a.	860	4,300
Insurance	1,000 p.a.	1,000	5,000
Repairs & Maintenance	3,500 p.a.	3,500	17,500
Depreciation	10,000 p.a.	10,000	50,000
Diesel *(See Note 1)*		7,200	36,000
Total		28,800	1,44,000
Cost per month		2,400	12,000
No. of students on half fee basis *(see Note 2)*		150	750
Cost per student (half fee)		Rs. 16.00	Rs. 16.00
Cost per student (full fee)		Rs. 32.00	Rs. 32.00

Working Notes

1. **Calculation of Diesel Cost per bus.**

Number of trips of 8 kms. each day 8.

Distance travelled per day by a bus: 8 × 8km / trip = 64 km.

Distance travelled during a month : 64 × 25 = 1,600 km.

Distance travelled p.a. 1,600 × 9 = 14,400 km.

(May, June and December being vacation)

Mileage 4 km./litre

Diesel required 14,400/4 = 3,600 litres.

Cost of diesel @ Rs. 2 per litre = Rs. 7,200 p.a. per bus.

2. **Calculation of number of students per bus**

Bus capacity	50 students.
Half fare 50% i.e.	25 students.
Full fare 50% i.e.	25 students.
Full fare students as equivalent to half fare students i.e.	50 students.
Total number of half fare students.	75 students. per trip
Total number of half fare students in two trips	150 students.
On full fare basis, number of students in two trips	75 students.

Question 5

SHANKAR has been promised a contract to run a tourist car on a 20 km. long route for the chief executive of a multinational firm. He buys a car costing Rs. 1,50,000. The annual cost of insurance and taxes are Rs. 4,500 and Rs. 900 respectively. He has to pay Rs. 500 per month for a garage where he keeps the car when it is not in use. The annual repair costs

are estimated at Rs. 4,000. The car is estimated to have a life of 10 years at the end of which the scrap value is likely to be Rs. 50,000.

He hires a driver who is to be paid Rs. 300 per month plus 10% of the takings as commission. Other incidental expenses are estimated at Rs. 200 per month.

Petrol and oil will cost Rs. 100 per 100 kms. The car will make 4 round trips each day. Assuming that a profit of 15% on takings is desired and that the car will be on the road for 25 days on an average per month, what should he charge per round-trip?

Answer

Statement of Operating cost.

Standing charges	*Per Annum* Rs.	*Per Month* Rs.
Depreciation	10,000	
Insurance	4,500	
Taxes	900	
Garage (Rs. 500 × 12)	6,000	
Annual repairs	4,000	
Driver's Salary (Rs. 300× 12)	3,600	
Incidental expenses (Rs. 200 × 12)	2,400	
	31,400	2,616.67
Variable expenses		
Petrol and Oil :		4,000.00
(4,000*kms × $\frac{1}{100}$ kms. × Rs.100)		
Total Cost (without commission)		6,616.67

Let X be the total takings per month

Driver's Commission = 10% of X = $\frac{10}{100} \times = \frac{X}{10}$

Profit = 15% of X = $\frac{15}{100}$ X $= \frac{3X}{20}$

Total takings per month = Total cost + Driver's Commission + Profit

or X = Rs. 6,616.67 + $\frac{X}{100} + \frac{3X}{20}$

or X – 3X/20 – X/10 = Rs. 6,616.67

or $\frac{20X - 3X - 2X}{20} = Rs.6,616.67$

or $\frac{15X}{20} = \text{Rs.}6{,}616.67$

or $X = \frac{\text{Rs.}6{,}616.67 \times 4}{3} = \text{Rs. } 8{,}822.22$

Total number of round trips per month : 25 days × 4 round trips per day = 100

Hence the charge per round trip $= \frac{\text{Rs.}8{,}822.22}{100}$

$= \text{Rs. } 88.22$

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* 20 kms. x 2 x 4 x round trips x 25 days = 4,000 kms.

Question 6

The Union Transport Company has been given a twenty kilometer long route to play a bus. The bus costs the company Rs. 1,00,000. It has been insured at 3% per annum. The annual road tax amounts to Rs. 2,000. Garage rent is Rs. 400 per month. Annual repair is estimated to cost Rs. 2,360 and the bus is likely to last for five years.

The salary of the driver and the conductor is Rs.600 and Rs. 200 per month respectively in addition to 10% of takings as commission to be shared equally by them. The manager's salary is Rs.1,400 per month and stationery will cost Rs. 100 per month. Petrol and oil cost Rs. 50 per 100 kilometers. The bus will make three round trips per day carrying on an average 40 passengers in each trip. Assuming 15% profit on takings and that the bus will ply on an average 25 days in a month, prepare operating cost statement on a full year basis and also calculate the bus fare to be charged from each passenger per kilometer.

Answer

Union Transport Company

Statement showing Operating Cost of the bus per annum

A. **Fixed Charges**

	Rs.
Manager's Salary (Rs. 1,400 × 12)	16,800
Driver's Salary (Rs. 600 × 12)	7,200
Conductor's Salary (Rs.200 × 12)	2,400
Road Tax	2,000

	Insurance (3% of Rs. 1,00,000)	3,000
	Garage rent (Rs. 400 x 12)	4,800
	Stationery (Rs. 100 × 12)	1,200
	Depreciation (Rs. 1,00,000/5 years)	20,000
		57,400
B.	**Maintenance Costs**	
	Repairs	2,360
C:	**Running Charges**	
	Petrol and Oil (36,000 Km* × Rs. 50)/100	18,000
	Total Cost (A + B + C):	77,760
Add:	10 percent of takings for commission of Driver and Conductor and 15 percent for desired profit i.e. 25 percent of takings or $33\frac{1}{3}$ percent on Total Cost	25,920
		1,03,680

*Calculation of distance covered

(20 Km × 2 × 3 × 25 × 12) = 36,000 Km per annum

Calculation of bus fare to be charged

Effective Passenger Kilometers: = (2 × 20 Km × 3 trips × 40 passengers × 25 days × 12 months)	14,40,000
Rate to be charged per kilometer from each passenger (Rs. 1,03,680/14,40,000)	7.2 Paise

Question 7

A company is considering three alternative proposals for conveyance facilities for its sales personnel who have to do considerable travelling, approximately 20,000 kilometers every year. The proposals are as follows:

(i) Purchase and maintain of its own fleet of cars. The average cost of a car is Rs. 1,00,000.

(ii) Allow the executive to use his own car and reimburse expenses at the rate of Rs. 1.60 paise per kilometre and also bear insurance costs.

(iii) Hire cars from an agency at Rs. 20,000 per year per car. The Company will have to bear costs of petrol, taxes and tyres.

The following further details are available:

Petrol Rs. 0.60 per km.

Repairs and maintenance Rs. 0.20 P per km.

Tyre rs. 0.12 P per km.

Insurance Rs. 1,200 per car per annum.

Taxes Rs. 800 per car per annum.

Life of the car: 5 years with annual mileage of 20,000 kms.

Resale value : Rs. 20,000 at the end of the fifth year.

Work out the relative costs of three proposals and rank them.

Answer

	Alternative Proposals		
	I	*II*	*III*
	Use of Concern's Car	*Use of own Car*	*Use of hire Car*
	Rs.	*Rs,*	*Rs.*
Re-imbursement of hire charges (A)		*1.60*	*1* (20,000/20,000Km)
Fixed Costs: (B) *(Per Car Per Km.)*			
Taxes (P.a.)	800	—	—	0.04 800/20,000 Km.
Depreciation (Rs.1,00,000 – Rs.20,000) / 5	16,000	—	—	—
Insurance	1,2000	—	0.06 (1200/20,000 Km)	—
Total *(Rs. 18,000/20,000 Km.)*	18,000	0.90	1.06	1.04
Running & Maintenance Cost per car per km. (C)				
Petrol		0.60	—	0.60
Repairs and maintenance		0.20	—	—
Tyre		0.12	—	0.12

Total cost: per km. (A + B + C)	1.82	1.66	1.76
Cost for 2,000 Kms.	Rs.36,400 (20,000×Rs.1.82)	Rs. 33,200 (20,000×Rs.1.66)	Rs. 35,200 (20,000×Rs.1.76)
Ranking of alternative proposals	III	I	II

Decision: Use of own car by Sales Executives will be the most economical proposal from the Concern's point of view. Hiring of car, for the use of Sales Executives will be the IInd best choice and maintaining a fleet of cars for its executives will be the costliest alternative.

Question 8

Prakash Automobiles distributes its goods to a regional dealer using a single Lorry. The dealer's premises are 40 kilometres away by road. The lorry has a capacity of 10 tonnes and makes the journey twice a day fully loaded on the outward journeys and empty on return journeys. The following information is available for a Four Weekly period during the year 1990:–

Petrol consumption	*8 kilometers per litre*
Petrol cost	*Rs. 13 per litre*
Oil	*Rs. 100 per week*
Driver's wages	*Rs. 400 per week*
Repairs	*Rs. 100 per week*
Garage rent	*Rs. 150 per week*
Cost of Lorry (Excluding Tyres)	*Rs. 4,50,000*
Life of Lorry	*80,000 kilometres*
Insurance	*Rs. 6,500 per annum*
Cost of Tyres	*Rs. 6,250*
Life of Tyres	*Rs. 25,000 kilometres*
Estimated sale value of Lorry at the end of its life	*Rs.50,000*
Vehicle Licence Cost	*Rs. 1,300 per annum*
Other overhead cost	*Rs. 41,600 per annum*

The Lorry operates on a five day week.

Required:

(a) A statement to show the total cost of operating the vehicle for the four weekly period analysed into running costs and fixed costs.

(b) Calculate the vehicle cost per kilometer and per tonne kilometer.

Answer

(a) Prakash Automobiles' Statement of Operating Cost of the Vehicle
(For the four weekly period)

Running Costs	*Rs.*
Petrol Cost *(Refer to Note 1)*	5,200
Oil expenses	400
Driver's wages	1,600
Repairs	400
Tyre Cost *(Refer to Note 2)*	800
Depreciation *(Refer to Note 3)*	16,000
Total running cost (A)	24,400
Fixed Costs	
Garage rent	600
Insurance *(Refer to Note 4)*	500
Licence Cost *(Refer to Note 5)*	100
Other Overhead *(Refer to Note 6)*	3,200
Total Fixed Cost (B)	4,400
Total Cost (A + B	28,800

(b) Cost per Kilometre $\frac{\text{Rs.}28,800}{3,200} = \text{Rs.}9$

Cost per tonne Kilometre $= \frac{\text{Rs.}28,800}{1{,}600\,\text{km.} \times 10\,\text{tonne}} = \text{Rs.}1.80$

Working Note

1. Total distance travelled by lorry in 4 weeks = 80 km. (distance traveled in 1 trip) × 2 trips × 20 days.
   = 3,200 km.

   Total consumption of petrol in 4 weeks $= \frac{3{,}200\,\text{km}}{8\,\text{km}} = 400\,\text{litre}$

   Petrol cost (for 4 weeks) = 400 litres × Rs. 13.

		=	Rs. 5,200
2.	Total distance travelled in 4 weeks	=	3,200 km.
	Tyre Cost (for 4 weeks)	=	$\frac{\text{Rs.}6,250 \times 3,200 \text{ km}}{25,000 \text{ km.}}$
		=	Rs. 800
3.	Cost of Lorry	=	Rs. 4,50,000
	Estimated sales value of lorry at the end of its life	=	Rs. 50,000
	Life of lorry	=	80,000 km
	Depreciation (for 4 weeks)	=	$\frac{\text{Rs.}4,50,000 - \text{Rs.}50,000}{80,000} \times 3,200 \text{ km}$
		=	Rs. 16,000
4.	Insurance (for 4 weeks)	=	$\frac{\text{Rs.}6,500}{52 \text{ weeks}} \times 4 \text{ weeks}$
		=	Rs. 500
5.	Licence Cost (for 4 weeks)	=	$\frac{\text{Rs.}1,300}{52 \text{ weeks}} \times 4 \text{ weeks}$
		=	Rs.100
6.	Other overheads (for 4 weeks)	=	$\frac{\text{Rs.}41,600}{52 \text{ weeks}} \times 4 \text{ weeks}$
		=	Rs. 3,200

Question 9

Mr. X owns a bus which runs according to the following schedule:

(i) Delhi to Chandigarh and back, the same day.

Distance covered: 150 kms, one way

Number of days run each month: 8

Seating capacity occupied 90%

(ii) Delhi to Agra and back, the same day.

Distance covered : 120 kms. One way

Number of days run each month: 10

Seating capacity occupied 85%

(iii) Delhi to Jaipur and back, the same day

Distance covered: 270 kms. one way.

Number of days run each month: 6

Seating capacity occupied 100%

(iv) Following are the other details:

Cost of the bus	*Rs. 6,00,000*
Salary of the driver	*Rs. 2,800 p.m.*
Salary of the Conductor	*Rs. 2,200 p.m.*
Salary of the part-time Accountant	*Rs. 200 p.m.*
Insurance of the bus	*Rs. 4,800 p.a.*
Diesel consumption 4 kms per litre	*Rs. 6 per litre*
Road tax	*Rs. 1,500 p.a.*
Lubricant oil	*Rs. 10 per 100 kms.*
Permit fee	*Rs. 315 p.m.*
Repairs and maintenance	*Rs. 1,000 p.m.*
Depreciation of the bus	*@ 20% p.a.*
Seating capacity of the bus	*50 persons.*

Passenger tax is 20% of the total takings. Calculate the bus fare to be charged from each passenger to earn a profit of 30% on total takings. The fares are to be indicated per passenger for the journeys:

(i) Delhi to Chandigarh

(ii) Delhi to Agra

(iii) Delhi to Jaipur

Answer

Working Notes

(1) **Total running Kms per month:**

	Km. per trip	*Trips per day*	*Days per month*	*Km. per month*
Delhi to Chandigarh	150	2	8	2,400
Delhi to Agra	120	2	10	2,400
Delhi to Jaipur	270	2	6	3,240
				8,040

(2) **Passenger Kms. per month:**

	Total seats available per month	*Capacity utilized* %	*Seats*	*Km.per trip*	*Passenger Kms. per month*
Delhi to Chandigarh & Back (50 seats × 2 trips × 8 days)	800	90	720	150	1,08,000
Delhi to Agra & Back (50 seats × 2 trips × 10 days)	1,000	85	850	120	1,02,000
Delhi to Jaipur & Back (50 seats × 2 trips × 6 days)	600	100	600	270	1,62,000
				Total	3,72,000

Operating Cost Statement (per month)

Fixed Costs:	*Rs.*	*Rs.*
Salary of Driver	2,800	
Salary of Conductor	2,200	
Salary of the part-time accountant	200	
Depreciation (Rs.6,00,000× $\frac{20}{100} \times \frac{1}{12}$)	10,000	
Insurance (Rs.4,800 × 1/12)	400	
Road Tax (Rs. 1,500 × 1/12)	125	
Repairs and maintenance	1,000	
Permit Fee	315	
Total fixed expenses		17,040
Variable Costs		
Diesel ($\frac{8{,}040 \text{ Kms.}}{4 \text{ Kms.}} \times$ Rs. 6) *(Refer to working note 1)*		12,060
Lubricant Oil ($\frac{8{,}040 \text{ Kms.}}{100 \text{ Kms.}} \times$ Rs.10) *(Refer to working note 1)*		804
Total Cost per month		29,904
Profit and passenger tax together accounts for 50% of total taking p.m. or 100% of cost		29,904
Total takings		59,808
Passenger tax (20% of takings)		11,961.60
Profit (30% of takings)		17,942.60

Rate per passenger Km. = $\frac{\text{Rs.59,808}}{\text{Rs.3,72,000}} = 0.1607741$ passenger Km.

(Refer to working note 2) or (Re. 0.16 say)

Fare to be charged

Delhi to Chandigarh, per passenger = 150 Kms. × 0.16 = Rs. 24

Delhi to Agra, per passenger = 120 Kms. × 0.16 = Rs. 19.20

Delhi to Jaipur, per passenger = 270 Kms. × 0.16 = Rs. 43.20

Question 10

A Mineral is transported from two mines – 'A' and 'B' and unloaded at plots in a Railway Station. Mine A is at a distance of 10 kms, and B is at a distance of 15 kms. from railhead plots. A fleet of lorries of 5 tonne carrying capacity is used for the transport of mineral from the mines. Records reveal that the lorries average a speed of 30 kms. per hour, when running and regularly take 10 minutes to unload at the railhead. At mine 'A' loading time averages 30 minutes per load while at mine 'B' loading time averages 20 minutes per load.

Drivers' wages, depreciation, insurance and taxes are found to cost Rs. 9 per hour operated. Fuel, oil, tyres, repairs and maintenance cost Rs. 1.20 per km.

Draw up a statement, showing the cost per tonne-kilometer of carrying mineral from each mine. *(Nov. 2000, 8 marks)*

Answer

Statement showing the cost per tonne-kilometer of carrying mineral from each mine

	Mine A	*Mine B*
	Rs.	*Rs.*
Fixed cost per trip		
(Driver's wages, depreciation, insurance and taxes)		
A: 1 hour 20 minutes @ Rs. 9 per hour	12	
B: 1 hour 30 minutes @ Rs. 9 per hour		13.50
(Refer to working note 1)		
Running and maintenance cost:		
(Fuel, oil, tyres, repairs and maintenance)		
A: 20 kms Rs. 1.20 per km.	24	
B: 30 kms. Rs. 1.20 per km.	___	36.00

Total cost per trip	36	49.50
Cost per tonne – km	0.72	0.66
(Refer to working note 2)	*(Rs.36/50 tonnes kms)*	*(Rs.49.50/75 tonnes kms)*

Working notes

		Mine A	*Mine B*
1.	*Total operated time taken per trip*		
	Running time to & fro	40 minutes $\left(20\,\text{kms.} \times \frac{60\,\text{minutes}}{30\,\text{kms}}\right)$	60 minutes $\left(30\,\text{kms.} \times \frac{60\,\text{minutes}}{30\,\text{kms}}\right)$
	Unloading time	10 minutes	10 minutes
	Loading time	30 minutes	20 minutes
	Total operated time	80 minutes or 1 hour 20 minutes	90 minutes or 1 hour 30 minutes
2.	*Effective tones – kms*	50 *(5 tonnes × 10 kms)*	75 *(5 tonnes × 15 kms.)*

Question 11

An article passes through five hand operations as follows:

Operation No.	*Time per article*	*Grade of worker*	*Wage rate per hour*
1	*15 minutes*	*A*	*Re. 0.65*
2	*25 minutes*	*B*	*Re. 0.50*
3	*10 minutes*	*C*	*Re. 0.40*
4	*30 minutes*	*D*	*Re. 0.35*
5	*20 minutes*	*E*	*Re. 0.30*

The factory works 40 hours a week and the production target is 600 dozens per week. Prepare a statement showing for each operation and in total the number of operators required, the labour cost per dozen and the total labour cost per week to produce the total targeted output. *(May 1996, 7 marks)*

Answer

Statement showing total number of operators required; the labour cost per dozen and the total labour cost per week to produce targeted output under each operation.

Operation No.	*No. of operators required **	*Labour cost of 600 dozens per week*	*Labour cost per dozen*
		Rs.	*Rs.*
1	45	1,170 (45 × 40 × 0.65P)	1.95 (Rs. 1,170/600)

2	75	1,500 (75×40 × 0.50p)	2.50 (Rs. 1,500/600)
3	30	480 (30 × 40 × 0.40p)	0.80 (Rs.480/600)
4	90	1,260 (90 × 40 × 0.35p)	2.10 (Rs. 1,260/600)
5	60	720 (60 × 40 × 0.30 p)	1.20 (Rs. 720/600)
	300	5,130	8.55

*** Working Note**

Operation No.	*No. of operators required*		
1	$\frac{600 \text{ dozens} \times 12}{40} \times \frac{15}{60}$	=	45
2	$\frac{600 \text{ dozens} \times 12}{40} \times \frac{25}{60}$	=	75
3	$\frac{600 \text{ dozens} \times 12}{40} \times \frac{10}{60}$	=	30
4	$\frac{600 \text{ dozens} \times 12}{40} \times \frac{30}{60}$	=	90
5	$\frac{600 \text{ dozens} \times 12}{40} \times \frac{20}{60}$	=	60

Question 12

A truck starts with a load of 10 tonnes of goods from station P. It unloads 4 tonnes at station Q and rest of the goods at station R. It reaches back directly to station P after getting reloaded with 8 tonnes of goods at station R. The distances between P to Q, Q to R and then from R to P are 40 kms, 60 kms, and 80 kms, respectively. Compute 'Absolute tonne-km' and 'Commercial tonne-km'. *(May, 1995, 4 marks)*

Answer

Absolute tonnes-kms = 10 tonnes × 40 kms + 6 tonnes × 60 kms.
+ 8 tonnes × 80 kms.
= 1,400 tonnes – kms.

Commercial tonnes-kms = Average load × Total kilometers travelled

$= \frac{(10+6+8)}{3} \text{ tonnes} \times 180 \text{ kms}$

= 8 tonnes × 180 kms

= 1,440 tonnes-kms

Note: It may be noted that while calculating the absolute tonnes – kms, the travel between any two stations is considered individually, while in the case of commercial tonne-kms, the trip is considered as a whole.

Question 13

EPS is a Public School having 25 buses each plying in different directions for the transport of its school students. In view of large number of students availing of the bus service, the buses work two shifts daily both in the morning and in the afternoon. The buses are garaged in the school. The workload of the students has been so arranged that in the morning, the first trip picks up senior students and the second trip plying an hour later picks up junior students. Similarly, in the afternoon, the first trip takes the junior students and an hour later the second trip takes the senior students home.

The distance travelled by each bus, one way is 16 kms. The school works 24 days in a month and remains closed for vacation in May and June. The bus fee, however, is payable by the students for all the 12 months in a year.

The details of expenses for the year 2003-2004 are as under:

Driver's salary – payable for all the 12 in month.	*Rs. 5,000 per month per drive.*
Cleaner's salary payable for all the 12 months	*Rs.3,000 per month per cleaner*
(one cleaner has been employed for every five buses).	
Licence Fees, Taxes etc.	*Rs. 2,300 per bus per annum*
Insurance Premium	*Rs. 15,600 per bus per annum*
Repairs and Maintenance	*Rs. 16,400 per bus per annum*
Purchase price of the bus	*Rs. 16,50,000 each*
Life of the bus	*16 years*
Scrap value	*Rs. 1,50,000*
Diesel Cost	*Rs. 18.50 per litre*

Each bus gives an average of 10 kms per litre of diesel. The seating capacity of each bus is 60 students. The seating capacity is fully occupied during the whole year.

The school follows differential bus fees based on distance traveled as under:

Students picked up and dropped within the range of distance from the school	*Bus fee*	*Percentage of students availing this facility*
4 kms	*25% of Full*	*15%*
8 kms	*50% of Full*	*30%*
16 kms	*Full*	*55%*

Ignore interest. Since the bus fees has to be based on average cost, you are required to

(i) Prepare a statement showing the expenses of operating a single bus and the fleet of 25 buses for a year.

(ii) Work out average cost per student per month in respect of:

(a) Students coming from a distance of upto 4 kms from the school.

(b) Students coming from a distance of upto 8 kms from the school; and

(c) Students coming from a distance of upto 16 kms from the school

(May, 2004, 10 marks)

Answer

(i) EPS Public School

Statement showing the expenses of operating a single bus and the fleet of 25 buses for a year

Particulars	*Per bus per annum (Rs.)*	*Fleet of 25 buses per annum (Rs.)*
Running costs : (a)		
Diesel	56,832	14,20,800
(Refer to working note 1)		
Repairs & maintenance costs: (B)	16,400	4,10,000
Fixed charges:		
Driver's salary	60,000	15,00,000
Cleaners salary	7,200	1,80,000
Licence fee, taxes etc.	2,300	57,500
Insurance	15,600	3,90,000
Depreciation	93,750	23,43,750
Total fixed charges: (C)	1,78,850	44,71,250
Total expenses: (A+B+C)	2,52,082	63,02,050

(ii) Average cost per student per month in respect of students coming from a distance of:

a)	4 kms. from the school (Rs. 2,52,082 / 354 students × 12 months) *(Refer to working note 2)*	Rs. 59.34
b)	8 kms from the school (Rs. 59.34 ×2)	Rs. 118.68
c)	16 kms from the school (Rs. 59.34 × 4)	Rs. 237.36

Working notes:

1. *Calculation of diesel cost per bus:*

No. of trips made by a bus each day	4
Distance travelled in one trip both ways (16 kms × 2 trips)	32 kms
Distance traveled per day by a bus (32 kms × 4 shifts)	128 kms
Distance traveled during a month (128 kms × 24 days)	3,072 kms
Distance traveled per year (3,072 kms × 10 months)	30,720 kms
No. of litres of diesel required per bus per year (30,720 kms / 10 kms)	3,072 litres
Cost of diesel per bus per year (3,072 litres × Rs. 18.50)	Rs. 56,832

2. Calculation of number of students per bus:

Bus capacity of 2 trips	120 students
1/4th fare students *(15% × 120 students)*	18 students
½ fare 30% students (equivalent to 1/4th fare students)	72 students
Full fare 55% students (equivalent to 1/4th fare students)	264 students
Total 1/4th fare students	354 students

Question 14

A transport company has a fleet of three trucks of 10 tonnes capacity each plying in different directions for transport of customer's goods. The trucks run loaded with goods and return empty. The distance travelled, number of trips made and the load carried per day by each truck are as under:

Truck No.	*One way Distance Km*	*No. of trips per day*	*Load carried per trip / day tonnes*
1	*16*	*4*	*6*
2	*40*	*2*	*9*
3	*30*	*3*	*8*

The analysis of maintenance cost and the total distance travelled during the last two years is as under

Year	*Total distance travelled*	*Maintenance Cost Rs.*
1	*1,60,200*	*46,050*
2	*1,56,700*	*45,175*

The following are the details of expenses for the year under review:

Diesel	*:*	*Rs. 10 per litre. Each litre gives 4 km per litre of diesel on an average.*
Driver's salary	*:*	*Rs. 2,000 per month*
Licence and taxes	*:*	*Rs. 5,000 per annum per truck*
Insurance	*:*	*Rs. 5,000 per annum for all the three vehicles.*
Purchase Price per truck	*:*	*Rs. 3,00,000 Life 10 years. Scrap value at the end of life is Rs. 10,000.*
Oil and sundries	*:*	*Rs. 25 per 100 km run.*
General Overhead	*:*	*Rs. 11,084 per annum*

The vehicles operate 24 days per month on an average.

Required

(i) Prepare an Annual Cost Statement covering the fleet of three vehicles.

(ii) Calculate the cost per km. run.

(iii) Determine the freight rate per tonne km. to yield a profit of 10% on freight

(Nov., 2001, 10 marks)

Answer

(i) Annual Cost Statement of three vehicles

	Rs.
Diesel *(Refer to working note I)* (1,34,784 kms / 4 km) × Rs. 10)	3,36,960
Oil & sundries (1,34,784 kms/100 kms) × Rs. 25	33,696
Maintenance *(Refer to working note 2)* *{(1,34,784 kms × 0.25P) + Rs. 6,000}*	39,696
Drivers' salary *(Rs. 2,000 × 12 months) × 3 trucks*	72,000
Licence and taxes	15,000
Insurance	5,000
Depreciation *(Rs. 2,90,000/10 years) × 3 trucks*	87,000
General overhead	11,084
Total annual cost	6,00,436

(ii) Cost per km. run

$$\text{Cost per kilometer run} = \frac{\text{Total annual cost of vehicles}}{\text{Total kilometre travelled annually}}$$

(Refer to working note 1)

$$= \frac{\text{Rs.}6,00,436}{1,34,784\ \text{Kms}} = \text{Rs.}4.4548$$

(iii) Freight rate per tonne km (to yield a profit of 10% on freight)

$$\text{Cost per tonne km.} = \frac{\text{Total annual cost of three vehicles}}{\text{Total effective tonnes kms. per annum}}$$

$$\textit{(Refer to working note 1)} = \frac{\text{Rs.}6,00,436}{5,25,312\ \text{kms}} = \text{Rs.}1.143$$

Freight rate per tonne km. = Rs. 1.27

$$\left(\frac{\text{Rs.}1.143}{9}\right) \times 10$$

Working notes:

1. Total kilometre travelled and tonnes kilometre (load carried) by three trucks in one year

Truck number	*One way distance in kms*	*No. of trips*	*Total distance covered in km per day*	*Load carried per trip / day in tonnes*	*Total effective tonnes km*
1	16	4	128	6	384
2	40	2	160	9	720
3	30	3	180	8	720
Total			468		1824

Total kilometre travelled by three trucks in one year 1,34,784

(468 kms × 24 days × 12 months)

Total effective tonnes kilometre of load carried by three trucks during one year 5,25,312 *(1,824 tonnes km × 24 days × 12 months)*

2. Fixed and variable component of maintenance cost:

$$\text{Variable maintenance cost per km} = \frac{\text{Difference in maintenance cost}}{\text{Difference in distance travelled}}$$

$$= \frac{\text{Rs.46,050} - \text{Rs.45,175}}{\text{1,60,200 kms} - \text{1,56,700 kms}}$$

$$= \text{Rs. 0.25}$$

Fixed maintenance cost = Total maintenance cost–Variable maintenance cost

= Rs. 46,050 – 1,60,200 kms × 0.25

= Rs. 6,000

Question 15

Global Transport Ltd. charges Rs. 90 per ton for its 6 tons truck lorry load from city 'A' to city 'B'. The charges for the return journey are Rs.84 per ton. No concession or reduction in these rates is made for any delivery of goods at intermediate station 'C'. In January 1997 the truck made 12 outward journeys for city 'B' with full load out of which 2 tones were unloaded twice in the way of city 'C'. The truck carried a load of 8 tons in its return journey for 5 times but once caught by police and Rs.1,200 was paid as fine. For the remaining trips the truck carried full load out of which all the goods on load were unloaded once at city 'C'. The distance from city 'A' to city 'C' and city 'B' are 140 kms and 300 kms respectively. Annual fixed costs and maintenance charges are Rs. 60,000 and Rs. 12,000 respectively Running charges spent during January, 1997 are Rs. 2,944.

You are required to find out the cost per absolute ton-kilometre and the profit for January, 1997 *(May, 1997, 12 marks)*

Answer

Operating Cost and Profit Statement

M/s Global Transport Ltd.

(during January, 1977)

	Rs.	
Fixed Costs (Rs. 60,000/12)	5,000	
Maintenance charges (Rs. 12,000/12)	1,000	
Running charges	2,944	
Total operating cost	8,944	
Cost per absolute ton – km (Rs. 8,944/44,720 absolute tons – kms) *(Refer to working note 3)*	0.20	
Net revenue received *(Refer to working note 4)*	12,168	
Less: Total operating cost	8,944	
Profit		3,224

Working Notes

1. *Outward journeys:*
   - (i) *From city A to city B:*
     10 journey × 300 kms × 6 tons = 18,000 tons – kms
   - (ii) *From city A to city C:*
     2 journeys × 140 kms × 6 tons = 1,680 tons – kms.
   - (iii) *From city C to city B:*
     2 journeys × 160 kms × 4 tons = 1,280 tons – kms
     Total: = 20,960 tons – kms
2. *Return journeys:*
   - (i) *From city B to city A:*
     5 journeys × 300 kms × 8 tons. = 12,000 tons – kms
     6 journeys × 300 kms × 6 tons = 10,800 tons – kms

(ii) *From city B to city C:*

1 journey × 160 kms. × 6 tons = 660 tons – kms.

Total = 23,760 tons – kms

3. *Total absolute tonnes – kms of outward and return journeys:*

(Refer to working notes 1 and 2) = 20,960 tons – kms + 23,760 tons – km

= 44,720 tons, - kms.

4. *Net revenue received during January, 1997:*

12 trucks + 6 tons × Rs. 90	6,480
(from city A to city B)	
5 trucks × 8 tons × Rs. 84	3,360
(from city B to city A)	
6 trucks × 6 tons × Rs. 84	3,024
(from city B to city A)	
1 truck × 6 tons × Rs. 84	504
(from city B to city C)	
Total revenue	13,368
Less: Fine paid	1,200
Net revenue received	12,168

Question 16

A transport service company is running five buses between two towns which are 50 kms apart. Seating capacity of each bus is 50 passengers. The following particulars were obtained from their books for April, 1998:

	Rs.
Wages of drivers, conductors and cleaners	*24,000*
Salaries of office staff	*10,000*
Diesel oil and other oil	*35,000*
Repairs and Maintenance	*8,000*
Taxation, Insurance etc.	*16,000*
Depreciation	*26,000*
Interest and other expenses	*20,000*
	1,39,000

Actually, passengers carried were 75 percent of seating capacity. All buses ran on all days of the month. Each bus has made one round trip per day.

Find out the cost per passenger km. *(Nov., 1998, 10 marks)*

Answer

Operating cost statement for the month of April, 1998

Particulars	*Amount*	
	Rs.	*Rs.*
A. Standing charges		
Wages of drivers, conductors and cleaners	24,000	
Salaries of office staff	10,000	
Taxation, insurance etc.	16,000	
Interest and other expenses	20,000	70,000
B. Running & maintenance cost		
Repairs and maintenance	8,000	
Diesel oil and other oil	35,000	
Depreciation	26,000	69,000
Total cost : (A+B)		1,39,000
Cost per passenger Km.		0.2471
(Rs. 1,39,000/5,62,500 passenger kms) *(Refer to working note)*		

Working note

Passenger Kms.: No. of Buses × Distance in one round trip per day × Seating capacity available in each bus × Percentage seating capacity actually used in each bus × No. of days in a month

= 5 Buses × 50 Kms. × 2 × 50 passengers × 75% × 30 days = 5,62,500 Kms.

Question 17

In order to develop tourism, ABCL airline has been given permit to operate three flights in a week between X and Y cities (both side). The airline operates a single aircraft of 160 seats capacity. The normal occupancy is estimated at 60% through out the year of 52 weeks. The one-way fare is Rs. 7,200. The cost of operation of flights are:

Fuel cost (variable)	*Rs. 96,000 per flight*
Food served on board on non-chargeable basis	*Rs. 125 per passenger*
Commission	*5% of fare applicable for all booking*
Fixed cost:	
Aircraft lease	*Rs. 3,50,000 per flight*
Landing Charges	*Rs. 72,000 per flight*

Required:

(i) Calculate the net operating income per flight.

(ii) The airline expects that its occupancy will increase to 108 passengers per flight if the fare is reduced to Rs. 6,720. Advise whether this proposal should be implemented or not. *(3+2=5 marks)*

Answer

	No. of passengers 160×60/100 = 96	*Rs*	*Rs.*
(i)	Fare collection 96×7,200		6,91,200
	Variable costs:		
	Fuel		96,000
	Food 96×125		12,000
	Commission 5%		34,560
	Total variable Costs		1,42,560
	Contribution per flight		5,48,640
	Fixed costs: Lease	3,50,000	
	Crew	72,000	4,22,000
	Net income per flight		1,26,640
(ii)	Fare collection 108×6,720		7,25,760
	Variable costs:		
	Fuel		96,000
	Food 108×125		13,500
	Commission @ 5%		36,288
	Contribution		5,79,972

There is an increase in contribution by Rs. 31,332. Hence the proposal is acceptable

Question 18

A Club runs a library for its members. As part of club policy, an annual subsidy of upto Rs. 5 per member including cost of books may be given from the general funds of the club. The management of the club has provided the following figures for its library department.

Number of Club members	*5,000*
Number of Library members	*1,000*
Library fee per member per month	*Rs. 100*
Fine for late return of books	*Re. 1 per book per day*
Average No. of books returned late per month	*500*
Average No. of days each book is returned late	*5 days*
Number of available old books	*50,000 books*
Cost of new books	*Rs. 300 per book*
Number of books purchased per year	*1,200 books*
Cost of maintenance per old book per year	*Rs. 10*

Staff details	*No.*	*Per Employee Salary per month (Rs.)*
Librarian	*01*	*10,000*
Assistant Librarian	*03*	*7,000*
Clerk	*01*	*4,000*

You are required to calculate:

(i) the cost of maintaining the library per year excluding the cost of new books;

(ii) the cost incurred per member per month on the library excluding cost of new books; and

(iii) the net income from the library per year.

If the club follows a policy that all new books must be purchased out of library revenue (a) What is the maximum number of books that can be purchased per year and (b) How many excess books are being purchased by the library per year?

Also, comment on the subsidy policy of the club. *(May 2007, 10 Marks)*

Answer

Computation of total revenue

No. of library members	No	1,000
Library fees per month	Rs.	1,00,000
Late fees per month (500 × 5 × 1)	Rs.	2,500
Total Revenue per month	Rs.	1,02,500
Total Revenue per annum (1,02,500 × 12)	**Rs.**	12,30,000

Computation of total cost

Staff details	*No.*	*Salary per month*	*Total cost*
		Rs.	*Rs.*
Librarian	1	10,000	10,000
Assistant Librarian	3	7,000	21,000
Clerk	1	4,000	4,000
Total Staff cost per month			35,000
Total Staff cost per year (35,000 × 12)			4,20,000
	No.	Cost per book	
Books maintenance cost	50,000	Rs. 10	5,00,000
Total maintenance cost per annum excluding cost of new books (4,20,000 + 5,00,000)			9,20,000

Cost incurred per library member per annum (Rs. 9,20,000/1,000)	Rs.	920
Cost incurred per member per month on the library excluding cost of new books (920/12)	Rs.	76.67
Cost incurred per club member per annum (9,20,000/5,000)	Rs.	184
Cost incurred per club member per month (184/12)	Rs.	15.33
Net income from the library per annum (12,30,000 – 9,20,000)	Rs.	3,10,000
Cost per new book	Rs.	300
Maximum number of new books per annum (3,10,000/300)	No.	1033.333

Present number of books purchased	No.	1200
Excess books purchased (1200 – 1033.333)	No.	166.6667
Subsidy being given per annum	Rs.	50,000
Subsidy per library member per annum (50,000/1,000)	Rs.	50
Subsidy per club member per annum (50,000/5,000)	Rs.	10

Comment:

The club is exceeding its subsidy target to members by Rs. 45 (Rs. 50 – 5) per library member and Rs. 5 (Rs. 10 – 5) per club member.

Question 19

A company runs a holiday home. For this purpose, it has hired a building at a rent of Rs. 10,000 per month alongwith 5% of total taking. It has three types of suites for its customers, viz., single room, double rooms and triple rooms.

Following information is given:

Type of suite	*Number*	*Occupancy percentage*
Single room	*100*	*100%*
Double rooms	*50*	*80%*
Triple rooms	*30*	*60%*

The rent of double rooms suite is to be fixed at 2.5 times of the single room suite and that of triple rooms suite as twice of the double rooms suite.

The other expenses for the year 2006 are as follows:

	Rs.
Staff salaries	*14,25,000*
Room attendants' wages	*4,50,000*
Lighting, heating and power	*2,15,000*
Repairs and renovation	*1,23,500*
Laundry charges	*80,500*
Interior decoration	*74,000*
Sundries	*1,53,000*

Provide profit @ 20% on total taking and assume 360 days in a year.

You are required to calculate the rent to be charged for each type of suite.

(May 2007, 10 Marks)

Answer

(i) Total equivalent single room suites

Nature of suite	Occupancy	Equivalent single room suites
Single room suites	100 × 360 × 100% = 36,000	36,000 × 1 = 36,000
Double rooms suites	50 × 360 × 80% = 14,400	14,400 × 2.5 = 36,000
Triple rooms suites	30 × 360 × 60% = 6,480	6,480 × 5 = 32,400
		Total 1,04,400

(ii) Statement of total cost:

	Rs.
Staff salaries	14,25,000
Room attendant's wages	4,50,000
Lighting, heating and power	2,15,000
Repairs and renovation	1,23,500
Laundry charges	80,500
Interior decoration	74,000
Sundries	1,53,000
	25,21,000
Building rent 10,000 × 12 + 5% on total taking	1,20,000
	+ 5% on takings
Total cost	26,41,000 + 5% on total takings

Profit is 20% of total takings

∴ Total takings = Rs. 26,41,000 + 25% of total takings

Let x be rent for single room suite

Then 1,04,400 x = 26,41,000 + 25% of (1,04,400 x)

or 1,04,400 x = 26,41,000 + 26,100 x

or 78,300 x = 26,41,000

or x = 33.73

(iii) Rent to be charged for single room suite = Rs. 33.73

Rent for double rooms suites Rs. 33.73 × 2.5 = Rs. 84.325

Rent for triple rooms suites Rs. 33.73 × 5 = Rs. 168.65

Question 20

A transport company has 20 vehicles, which capacities are as follows:

No. of Vehicles	*Capacity per vehicle*
5	*9 tonne*
6	*12 tonne*
7	*15 tonne*
2	*20 tonne*

The company provides the goods transport service between stations 'A' to station 'B'. Distance between these stations is 200 kilometres. Each vehicle makes one round trip per day an average. Vehicles are loaded with an average of 90 per cent of capacity at the time of departure from station 'A' to station 'B' and at the time of return back loaded with 70 per cent of capacity. 10 per cent of vehicles are laid up for repairs every day. The following informations are related to the month of October, 2008:

Salary of Transport Manager	*Rs. 30,000*
Salary of 30 drivers	*Rs. 4,000 each driver*
Wages of 25 Helpers	*Rs. 2,000 each helper*
Wages of 20 Labourers	*Rs. 1,500 each labourer*
Consumable stores	*Rs. 45,000*
Insurance (Annual)	*Rs. 24,000*
Road Licence (Annual)	*Rs. 60,000*
Cost of Diesel per litre	*Rs. 35*
Kilometres run per litre each vehicle	*5 Km.*
Lubricant, Oil etc.	*Rs. 23,500*
Cost of replacement of Tyres, Tubes, other parts etc.	*Rs. 1,25,000*
Garage rent (Annual)	*Rs. 90,000*
Transport Technical Service Charges	*Rs. 10,000*
Electricity and Gas charges	*Rs. 5,000*
Depreciation of vehicles	*Rs. 2,00,000*

There is a workshop attached to transport department which repairs these vehicles and other vehicles also. 40 per cent of transport manager's salary is debited to the workshop. The transport department is charged Rs. 28,000 for the service rendered by the workshop during October, 2008. During the month of October, 2008 operation was 25 days.

You are required:

(i) Calculate per ton-km operating cost.

(ii) Find out the freight to be charged per ton-km, if the company earned a profit of 25 per cent on freight. *(November 2008 8 marks)*

Answer

(i) **Operating Cost Sheet**

for the month of October, 2008

	Particulars	*Amount (Rs.)*
A.	Fixed Charges:	
	Manager's salary: Rs. $30,000 \times \frac{60}{100}$	18,000
	Drivers' Salary : Rs. 4,000 × 30	1,20,000
	Helpers' wages : Rs. 2,000 × 25	50,000
	Labourer wages : Rs. 1,500 × 20	30,000
	Insurance : $\frac{Rs.24,000}{12}$	2,000
	Road licence : $\frac{Rs.60,000}{12}$	5,000
	Garage rent: $\frac{Rs.90,000}{12}$	7,500
	Transport Technical Service Charges	10,000
	Share in workshop expenses	28,000
	Total (A)	2,70,500
B.	Variable Charges:	
	Cost of diesel	12,60,000
	Lubricant, Oil etc.	23,500

	Depreciation	2,00,000
	Replacement of Tyres, Tubes & other parts	1,25,000
	Consumable Stores	45,000
	Electricity and Gas charges	5,000
	Total (B)	16,58,500
C.	Total Cost (A + B)	19,29,000
D.	Total Ton-Kms.	18,86,400
E.	Cost per ton-km. (C/D)	1.022

(ii) Calculation of Chargeable Freight

Cost per ton-km.	Rs. 1.022
Add: Profit @ 25% on freight or 33⅓% on cost	**Re. 0.341**
Chargeable freight per ton-km.	**Rs. 1.363 or Rs. 1.36**

Workings:

1. Cost of Diesel:

Distance covered by each vehicle during October, 2008 = 200 × 2 × 25 × 90/100 = 9,000 km.

Consumption of diesel = $\frac{9,000 \times 20}{5} = 36,000$ litres.

Cost of diesel = 36,000 × Rs. 35 = Rs. 12,60,000.

2. Calculation of total ton-km:

Total Ton-Km. = Total Capacity × Distance covered by each vehicle × Average Capacity Utilisation ratio.

$= [(5 \times 9) + (6 \times 12) + (7 \times 15) + (2 \times 20)] \times 9,000 \times \frac{(90\% + 70\%)}{2}$

$= (45 + 72 + 105 + 40) \times 9,000 \times 80\%$

= 262 × 9,000 × 80%.

= 18,86,400 ton-km.

10
Process & Operation Costing

Question 1

Distinguish between job costing and process costing. *(November,1996, 4 marks)*

Answer

The main points of distinction between job costing and process costing are as below:

	Job Costing	*Process Costing*
1.	Job costing is a specific order costing	Process costing is a method of costing used to ascertain the cost of a product at each stage of manufacture
2.	Cost here is determined on job basis	Costs are accumulated for each process separately for a given period of time.
3.	Each job needs special treatment and no two jobs are alike	Finished product of one process becomes the raw material for the next process.
4.	The cost of each job is compiled separately by adding materials, labour and overhead costs	The unit cost here is the average cost of the process for a given period. Its correct computation requires the measurement of production at various stages of manufacture.
5.	Costs are computed when job is completed	Costs are computed for each process at the end of each period.
6.	As each job is distinct or is of different nature, more detailed supervision and control are necessary	As the process operations are standardised accumulation of costs and supervision and control are comparatively easier.

Question 2

Write a short note on unit costing method for ascertaining product cost

(November, 1995, 6 marks)

Answer

It is a form of process or operation costing. It is suitable where only one product or a few grades of the same product involving a single process or operation is produced. Under this system the expenditure is not analysed in as much detail as is necessary for job costing because the whole of the expenditure is normally incurred for only one type of product but where, however, articles produced vary in grades and sizes, it is necessary to analyse the appropriate charges for ascertaining the cost of articles. On dividing the total expenditure by the number of units produced, the cost per unit is ascertained. This system of costing is suitable for breweries, cement works etc.

In all these cases, unit cost of articles produced requires to be ascertained.

The cost sheets are prepared periodically and usually contain information on the under mentioned points:

(i) Cost of materials consumed with details.

(ii) Cost of labour with details.

(iii) Work indirect expenses with details.

(iv) Office and administrative expenses in lumpsum.

(v) Abnormal losses and gains are separated and not mixed with costs.

Question 3

"The value of scrap generated in a process should be credited to the process account." Do you agree with this statement? Give reasons. *(November, 1995, 2 marks)*

Answer

This statement is not correct The value of scrap (as normal loss) received from its sale is credited to the process account. But the value of scrap received from its sale under abnormal conditions should be credited to Abnormal Loss Account.

Question 4

Explain normal wastage, abnormal wastage and abnormal gain and state, how they should be dealt within process Cost Accounts. *(November, 1998, 6 marks)*

Answer

Normal wastage: It is defined as the loss of material which is inherent in the nature of work. Such wastage can be estimated in advance on the basis of past experience or technical specifications. If the wastage is within the specified limit, it is considered as normal. Suppose a company states that the normal wastage in Process A will be 5% of input. In such a case wastage upto 5% of input will be considered as normal wastage of the process.

When the wastage fetches no value, the cost of normal wastage is absorbed by good production units of the process and the cost per unit of good production is increased

accordingly. If the normal wastage realises some value, the value is credited to the process account to arrive at normal cost of normal output.

Abnormal wastage: It is defined as the wastage which is not inherent to manufacturing operations. This type of wastage may occur to the carelessness of workers, a bad plant, design etc. Such a wastage cannot be estimated in advance.

The units representing abnormal wastage are valued like good, units produced and debited to the separate account which is known as abnormal wastage account. If the abnormal wastage fetches some value, the same is credited to abnormal wastage account. The balance of abnormal wastage account i.e. difference between value of units representing abnormal wastage minus realisation value is transferred to Costing profit and loss account for .the year.

Abnormal gain: It is defined as unexpected gain in production under normal conditions. In other words, if the actual process waste is less than the estimated normal waste, the difference is considered as abnormal gain. Suppose, a Company states that 10% of its input will be normal loss of process A. If input of this company is 100 units then its normal output should be 90 units. If actual output is 95 units, then, 5 units will represent its abnormal gain! These units which represents abnormal gain are valued like normal output of the process. The concerned process account is debited with the quantity and value of abnormal gain. The abnormal gain account is credited with the figure of abnormal gain amount. Abnormal gain being the result of actual wastage, or loss being less than the normal. The scrap realisation shown against normal wastage gets reduced by the scrap value of abnormal gain. Consequently; there is an apparent loss by way of reduction in the scrap realisation attributable to abnormal effectives. This loss is set off against abnormal effectives by debiting, the account. The- balance; of this account becomes abnormal gain and is transferred to; costing profit and loss account.

Question 5

Write short note on Abnormal gain in Process Costing *(May, 1995,4 marks)*

Answer

Abnormal Gain in Process Costing: If in a process the actual process loss (which is inherent in a process) is less than the estimated normal loss, the difference is considered as abnormal gain. Abnormal gain is accounted for in the same way as abnormal process loss.

The concerned process account is debited with the abnormal gain units and value, and the abnormal gain account is credited. The abnormal gain account is debited with the figure of reduced normal loss (in units) and value. The balance of the abnormal gain account is transferred to the costing profit and loss account.

Question 6

Compare Process Costing with Job Costing *(November, 1998, 4 marks)*

Answer

Job costing and process costing are the two methods of cost accounting. Job costing is applied where production is carried out under specific orders, depending upon customers requirement. Here each job is considered as a cost unit and to some extent the cost centre also.

Process costing is applied in cases where the identity of individual orders is lost in the general flow of production. Industries to which process costing is applied produce uniform products without reference to the specific requirements of customers.

The main points of comparison between job costing and process costing are as follows:

(i) Job costing is applicable to goods produced/ manufactured to customers specifications. However, process costing is applicable to production consisting of succession of continuous operations or processes.

(ii) Costs are accumulated by a job or work order irrespective of its time of completion under job costing. When a job is finished all costs associated with it are charged to it in full. Whereas under process costing costs are accumulated by processes for a particular period regardless of the number of units produced.

(iii) Each job will be .different from the other under job costing whereas in the case of process costing units of product are homogenous and indistinguishable, because goods are produced on a mass scale.

(iv) Job is normally a single unit, the whole unit is taken as one for costing purposes. Even if job consists of number of parts, cost of job is calculated only after all the parts, are complete. As such there is no question of work-in-progress merely because some parts are not yet completed. In the case of process costing, the unit of production may remain incomplete at various stages of production. It is therefore necessary to compute at the end of the period not only the cost of the finished units but of work in progress also.

(v) Job costing does not involve transfer of costs from one job to another. Where as in the case of process costing transfer of output from one process to another involves the transfer of its costs as well.

(vi) Job costs are ascertained only after the completion of job and not at the end of a particular period. Whereas in the case of process costing costs are ascertained at the end of the accounting period and not when the process is complete, since production is a continuous flow constituting itself into cycle.

(vii) Since each job may be different from other therefore they will not involve the use of identical material and labour, costs of jobs cannot be ascertained by averaging. In the case of process costing since units of production are uniform and are at the same stage of production therefore, costs are computed by averaging the total cost of each stage of production.

(viii) Control becomes difficult in the case of job costing because each job is different from the other. Whereas control over production and costs is easier in the case of process costing since production is a standardised one.

Question 7

A company within the food industry mixes powdered ingredients in two different processes to produce one product. The output of Process I becomes the input of Process 2 and the output of Process 2 is transferred to the packing department.

From the information given below, you are required to open accounts for Process 1, Process 2, abnormal loss and packing department and to record the transactions for the week ended 11th May,1985.

Process 1

Input:

Material A	*6,000 kilograms at 50 paise per kilogram*
Material B	*4,000 kilograms at Rupee 1 per kilogram*
Mixing Labour	*430 hours at Rs.2 per hour*
Normal Loss	*5% of weight input, disposed off at 16 paise per kilogram*
Output	*9,200 kilograms.*

No work in process at the beginning or end of the week.

Process 2

Input

Material C	*6,600 kilograms at Rs. 1.25 per kilogram*
Material D	*4,200 kilograms at Re. 0.75 per kilogram*
Flavouring Essence	*Rs. 330*
Mixing Labour	*370 hours at Rs. 2 per hour*
Normal Waste	*5% of weight input with no disposal value*
Output	*18,000 kilograms.*

No work in process at the beginning of the week but 1,000 kilograms in process at the end of the week and estimated to be only 50% complete so far as labour and overhead were concerned.

Overhead of Rs. 3,200 incurred by the two processes to be absorbed on the basis of mixing labour hours.

Answer

Process 1 Account

	Kg.	*Per kg.*			*Kg.*	*Per kg.*	
		Rs.	*Rs.*			*Rs.*	*Ps.*
To Material A	6,000	0.50	3,000	By Normal Loss	500	0.16	80
To Material B	4,000	1.00	4,000	By Abnormal Loss *(See Note 2)*	300	1.00	300
To Mixing Labour *(430 hours @ Rs.2.00 per hour)*			860	To Transfer to Process 2	9,200	1.00	9,200
To Overhead			1,720				
	10,000		9,580		10,000		9,580

Process 2 Account

	Kg.	*Per Kg.*			*Kg.*	*Per kg.*	
		Rs.	*Rs.*			*Rs.*	*Rs.*
To Process 1	9,200	1.00	9,200	By Normal Waste	1,000		
To Material C	6,600	1.25	8,250	To Work in-process *(See Note 3)*	1,000		1,160
To Material D	4,200	0.75	3,150				
To Flavouring Essence			300				
To Mixing Labour *(370 hours @ 2.00 per hour)*			740	To Packing Deptt.	18,000	1.22	21,690
To Overhead *(See Note 1)*			1,480				
	20,000		23,120		20,000		23,120

Abnormal Loss Account

	Kg.	*Per Kg.*			*Kg.*	*Per kg.*	
		Rs.	*Rs.*			*Rs.*	*Rs.*
To Process A/c	300	1.00	300	By Sale A/c	300	0.16	48
				By Balance to P/L A/c			252
			300				300

Packing Department Account

	Kg.	*Per Kg.*			*Kg.*	*Per kg.*	
		Rs.	*Rs.*			*Rs.*	*Rs.*
To Process 2 A/c	18,000	1.22	21,960	By Balance			21,960
			21,960				21,960

Notes:

1. Total overhead expenses : Rs. 3,200

   Total labour hours in Process 1 and 2 = 800

   Overhead absorption rate = Rs. 3,200/800 hours = Rs. 4 per labour hour

   Overhead under Process 1 = 430 × Rs. 4 = Rs. 1,720

   Overhead under Process 2 = 370 × Rs. 4 = Rs. 1,480

2. Cost of 9,500 Kg. of output is = (Rs. 9,580 – Rs. 80) i.e., Rs. 9,500

   Hence cost per kg. of output is Re. 1.00

3. **Equivalent Units Statement of Output**

Output Units		***Equivalent Units***		
		Material	*Labour*	*Overhead*
Completed	18,000	18,000	18,000	18,000
WIP (100% Material 50% Labour and Overhead)	1,000	1,000	500	550
Normal Waste	1,000	____	____	____
	20,000	19,000	18,500	18,500

Cost Statement for the week ending 11th May 1985

	Rs.
Material (Process 1)	9,200
Material C	8,250
Material D	3,150
Flavouring Essence	300
Total Material Cost	20,900
Total Mixing Labour Cost	740
Total Overhead Cost	1,480

Cost per Equivalent Unit

Material = Rs. 20,900 / 19,000 = Rs. 1.10

Labour = Rs. 740 / 18,500 = 0.04 P

Overhead = Rs. 1,480 / 18,500 = 0.08 P

W.I.P.

Material =	1,000	× Rs. 1.10	= Rs. 1,100
Labour =	500	× 0.04 P	= Rs. 20
Overhead =	500	× 0.08 P	= Rs. 40
			Rs. 1,160

Question 8

In a manufacturing unit, raw material passes through four processes I, II, III & IV and the output of each process is the input of the subsequent process. The loss in the four processes I, II, III & IV are respectively 25%, 20%, 20% and 16-2/3% of the input. If the end product at the end of the process IV is 40,000 kg, what is the quantity of raw material required to be fed at the beginning of Process I and the cost of the same at Rs. 4 per kg.?

Find out also the effect of increase or decrease in the material cost of the end product for variation of every rupee in the cost of the raw material.

Answer

Statement of Production
(based on 100 kg. of input)

Process No.	*Input Kg.*	*Loss Percentage*	*Loss Kg.*	*Output Kg.*
I	100	25	25	75
II	75	20	15	60
III	60	20	12	48
IV	48	$16^{2}/_{3}$	8	40

Quantity of Raw Material required for 40,000 kg. of output

As is apparent from the above table, 40 kg of output requires 100 kg. of raw material to be fed at the beginning of Process I.

Therefore 1 kg of output require 2.5 kg. of raw material to be fed at the beginning of the process I.

Hence 40,000 kg. of output will require 1,00,000 kg. of raw material at the beginning of the Process I.

Cost of Raw Material required: 1,00,000 kg. × Rs. 5

= Rs. 5,00,000

Effect of increase or decrease in the material cost: For every increase or decrease of Re.1, in the cost of raw material, the corresponding increase or decrease in the material cost of 1 kg. of the end product is Rs. 2.50. Therefore the material cost of the end product / finished product goes up or down by Rs. 2.50 per kg. as the cost of raw material goes up or down by Re.1/- per kg.

Question 9

A company is manufacturing building bricks and fire bricks. Both the products require two processes:

Brick-forming

Heat treating

Time requirements for the two bricks are:

	Building Bricks	*Fire Bricks*
Forming per 100 Bricks	*3 Hrs.*	*2 Hrs.*
Heat – treatment per 100 Bricks	*2 Hrs.*	*5 Hrs.*

Total costs of the two departments in one month were

Forming	*Rs. 21,200*
Heat treatment	*Rs. 48,800*

Production during the month was:

Building bricks	*1,30,000 Nos.*
Fire Bricks	*70,000 Nos.*

Prepare a statement of manufacturing costs for the two varieties of bricks.

Answer

Computation of Total Cost: It can be calculated in the case of brick forming and heat treating by using the rte per hour as calculated in the statement or by using the following:

Cost of brick forming Building and Fire bricks can be determined by dividing the total cost of forming i.e., Rs. 21,200 in the ratio 39:14.

Cost of forming Building bricks : $\frac{Rs.21,200}{53} \times 39 = Rs.\ 15,600$

Cost of forming Fire bricks : $\frac{Rs.21,200}{53} \times 14 = Rs.\ 5,600$

Cost of giving heat treatment to Building and Fire Bricks are determined by dividing the total cost of heat treatment i.e., Rs. 48,800 in the ratio 26:35

Cost of heat treatment to Building Bricks $\frac{\text{Rs..48,800}}{61} \times 26 = \text{Rs. } 20,800$

Cost of heat treatment to Fire Bricks : $\frac{\text{Rs.48,800}}{61} \times 35 = \text{Rs. } 28,000$

Manufacturing Cost Statement

(for two varieties of bricks)

Processes	*Building Bricks*					*Fire Bricks*				
	Time per 100 Nos. (Hrs.)`	*Total time (Hrs.)*	*Rate per Hr.*	*Total Cost (for 1,30,000 Nos.)*	*Cost per 100 Nos.*	*Time per 100 Nos. (Hrs.)*	*Total time (Hrs.)*	*Rate per Hr.*	*Total Cost (for 1,30,000 Nos.)*	*Cost per 100 Nos.*
			Rs.	*Rs.*	*Rs.*			*Rs.*	*Rs.*	*Rs.*
Brick forming	3	3,900	4.00	15,600	12.00	2	1,400	4.00	5,600	8.00
Heat treating	2	2,600	8.00	20,800	16.00	5	3,500	8.00	28,000	40.00
Total		6,500		36,400	28.00		4,900		33,600	48.00

Working Notes:

Computation of rate per hour

Brick forming : $= \frac{\text{Rs.21,200}}{5,300} = \text{Rs. } 4.00$

(Total cost / Total hours)

Heat treating: $= \frac{\text{Rs.48,800}}{6,100} = \text{Rs. } 8.00$

Question 10

An article passes through three successive operations from the raw material to the finished product stage. The following data are available from the production records of a particular month:–

Operation No.	*No. of Pcs. Input*	*No. of Pcs. Rejected*	*No. of Pcs. Output*
1	*60,000*	*20,000*	*40,000*
2	*66,000*	*6,000*	*60,000*
3	*48,000*	*8,000*	*40,000*

(i) Determine the input required to be introduced in the first operation in number of pieces in order to obtain finished output of 100 pieces after the last operation.

(ii) Calculate the cost of raw material required to produce one piece of finished product, given the following information.

Weight of the finished piece is 0.10 kg. and the price of raw material is Rs. 20 per kg.

Answer

Statement of Production
(for a month)

	Input		*Rejections*	*Output*
Operations No.	*Total No.*	*Total No.*	*% Rejection to output*	*Total No.*
1	60,000	20,000	50%	40,000
2.	66,000	6,000	10%	60,000
3.	48,000	8,000	20%	40,000

Input required for final output of 100 units:

	No. of Pcs.
Output of process 3	100
Loss in process, 20%	20
Input to process 3 or output of process 2	120
Loss in process 2, 10%	12
Input to process 2 or output of process 1	132
Loss in process 1, 50%	66
Input in process 1	198

(iii) To produce 100 pieces of final output 198 pieces of initial input is used. The weight of one piece of finished output is 0.10 kg. Thus the weight of input to produce one piece of output is 0.198 kg. The rate being Rs.20, the cost of materials for producing 1 piece is Rs.3.96

i.e., $\frac{198}{100} \times 0.10$

Question 11

A Ltd. produces product 'AXE' which passes through two processes before it is completed and transferred to finished stock. The following data relate to October 1981.

Particulars	*Process*		*Finished stock*
	I	*II*	
	Rs.	*Rs.*	*Rs.*
Opening stock	*7,500*	*9,000*	*22,500*
Direct materials	*15,000*	*15,750*	
Direct wages	*11,200*	*11,250*	
Factory overheads	*10,500*	*4,500*	
Closing stock	*3,700*	*4,500*	*11,250*
Inter-process profit			
Included in opening stock		*1,500*	*8,250*

Output of process I is transferred to process II.

at 25% profit on the transfer price.

Output of process II is transferred to finished stock at 20% profit on the transfer price. Stocks in process are valued at prime cost. Finished stock is valued at the price at which it is received from the process II. Sales during the period are Rs. 1,40,000.

Required:

Process cost accounts and finished goods account showing the profit element at each stage.

Answer

Process I Account

	Total Rs.	*Cost Rs.*	*Profit Rs.*		*Total Rs.*	*Cost Rs.*	*Profit Rs.*
Opening stock	7,500	7,500	—	Transfer	54,000	40,500	13,500
Direct materials	15,000	15,000	—	to process			
Direct Wages	11,200	11,200		II Account			
	33,700	33,700					
Less: Closing Stock	3,700	3,700	—				
Prime cost	30,000	30,000	—				
Overheads	10,500	10,500	—				
Process cost	40,500	40,500					
Profit $33\frac{1}{3}\%$							

of total cost	13,500	—	13,500				
(See working note 1)							
	54,000	40,500	13,500		54,000	40,500	13,500

Process II Account

	Total Rs.	*Cost Rs.*	*Profit Rs.*		*Total Rs.*	*Cost Rs.*	*Profit Rs.*
Opening stock	9,000	7,500	1,500	Transfer to			
Transferred from Process I	54,000	40,500	—	Finished Stock A/c	112,500	75,750	36,750
Direct materials	15,750	15,750	—				
Direct wages	11,250	11,250	—				
	90,000	75,000	15,000				
Less: Closing Stock	4,500	3,750	750				
Prime cost	85,500	71,250	14,250				
Overheads	4,500	4,500	—				
Process cost	90,000	75,750					
Profit 25% on total cost	22,500	—	22,500				
(See working note 1)							
	1,12,500	75,750	36,750		1,12,500	75,750	36,750

Finished Stock Account

	Total Rs.	*Cost Rs.*	*Profit Rs.*		*Total Rs.*	*Cost Rs.*	*Profit Rs.*
Opening stock	22,500	14,250	8,250	Sales	1,40,000	82,500	57,500
Transferred from Process II	1,12,500	75,750	36,750				
	1,35,000	90,000	45,000				
Less: Closing Stock	11,250	7,500	3,750				
Finished Stock at							

cost	1,23,750	82,500	41,250			
Profit	16,250	—	12,250			
	1,40,000	82,500	57,500	1,40,000	82,500	57,500

Working Notes

Let the transfer price, be 100 then profit is 25; i.e. cost price is 75

1. If cost is Rs. 75 then profit is Rs. 25

   If cost is Rs. 40,500 then profit is $\frac{25}{75} \times 40,500 = Rs.\ 13,500$

2. If cost is Rs. 80 then profit is Rs. 20

   If cost is Rs. 90,000 then profit is $\frac{20}{80} \times 90,000 = Rs.\ 22,500$

3. Out of Rs. 90,000 total cost, the profit is Rs. 15,000

   If the cost is Rs. 4,500, the profit is $\frac{15,000}{90,000} \times Rs.\ 4,500 = Rs.\ 750$

Question 12

The following data pertains to Process I for March 1987 of Beta Limited :

Opening Work in Progress	*1,500 units at*	*Rs. 15,000*
Degree of completion		
Materials 100% ; Labour and Overheads $33\frac{1}{3}$ *%*		
Input of Materials	*18,500 Units at*	*Rs. 52,000*
Direct Labour		*Rs. 14,000*
Overheads		*Rs. 28,000*
Closing Work in Progress	*5,000 units*	
Degree of Completion Materials 90%		
and		
Labour and Overheads 30%		
Normal Process Loss is 10% of total		
Input (opening work in progress units + units put in)		
Scrap value Rs. 2.00 per unit		
Units transferred to the next process 15,000 units.		
Your are required to :–		

(a) *Compute equivalent units of production.*

(b) *Compute cost per equivalent unit for each cost element i.e., materials, labour and overheads.*

(c) *Compute the cost of finished output and closing work in progress.*

(d) *Prepare the process and other Accounts.*

Assume: (I) *FIFO Method is used by the Company.*

(ii) *The cost of opening work in progress is fully transferred to the next process.*

Answer

(a) Statement of Equivalent Units of Production

INPUT			*OUTPUT*	*EQUIVALENT PRODUCTION*			
				Material		*Labour & Overhead*	
Particulars	*Units*	*Particulars*	*Units*	*%*	*Units*	*%*	*Units*
Op. WIP	1,500	Work on Op. WIP	1,500	—	—	$66\frac{2}{3}$	1,000
Introduced	18,500	Introduced and completed in the period	13,500	100	13,500	100	13,500
		Transferred to next process	15,000				
		Normal Loss	2,000	—	—	—	—
		Closing WIP	5,000	90	4,500	30	1,500
			22,000		18,000		16,000
		Less: Abnormal Gain	2,000	100	2,000	100	2,000
	20,000		22,000		16,000		14,000

(b) Statement of Cost per Equivalent Unit for Each Cost Element

		Cost	*Equivalent Units*	*Cost per Equivalent Unit*
	Rs.	*Rs.*		*Rs.*
Material	52,000			
Less: Scrap Value	4,000	48,000	16,000	3

Labour	14,000	14,000	1
Overheads	28,000	14,000	2

(c) Statement of Cost of Finished Output and Closing Work in Progress

Particulars	*Elements*	*Equivalent Units*	*Cost per Units*	*Cost of Equivalent Units*	*Total*
			Rs.	*Rs.*	*Rs.*
Opening WIP *(1,500 units)*		—	—	—	15,000
Opening WIP	Material	NIL	—	—	
Opening WIP	Labour	1,000	1	1,000	
Opening WIP	Overhead	1,000	2	2,000	3,000
Units introduced and completed during the period	Material	13,500	3	40,500	
"	Labour	13,500	1	13,500	
"	Overhead	13,500	2	27,000	81,000
Total Cost of 15,000 Units of finished output					*99,000*
Closing WIP	Material	4,500	3	13,500	
(5,000 units)	Labour	1,500	1	1,500	
	Overhead	1,500	2	3,000	
Total cost of closing WIP (5,000 units)				18,000	

(d) Process Account – I

	Units	*Rs.*		*Units*	*Rs.*
To Opening WIP	1,500	15,000	By Normal Loss	2,000	4,000
To Units introduced (Direct Material)	18,500	52,000	By Transfer to next process	15,000	99,000
To Direct Labour	—	14,000	By Closing WIP	5,000	18,000
To Overhead	—	28,000			
To Abnormal Gain *(See working note)*	2,000	12,000			
	22,000	1,21,000		22,000	1,21,000

Abnormal Gain Account

	Units	*Rs.*		*Units*	*Rs.*
To Process A/c I	2,000	4,000	By Process I	2,000	12,000
To Profit & Loss A/c	—	8,000			
		12,000			12,000

Working Note

Total cost of Abnormal Gain:

(2,000 Units) @ Rs. 6/- p.u. = Rs. 12,000

Question 13

The following data are available in respect of Process 1 for February 1990 :

(1) Opening stock of work in process : 800 units at a total cost of Rs. 4,000.

(2) Degree of completion of opening work in process:

Material	*100%*
Labour	*60%*
Overheads	*60%*

(3) Input of materials at a total cost of Rs. 36,800 for 9,200 units.

(4) Direct wages incurred Rs. 16,740

(5) Production overhead Rs. 8,370.

(6) Units scrapped 1,200 units. The stage of completion of these units was:

Materials	*100%*
Labour	*80%*
Overheads	*80%*

(7) Closing work in process; 900 units. The stage of completion of these units was:

Material	*100%*
Labour	*70%*
Overheads	*70%*

(8) 7,900 units were completed and transferred to the next process.

(9) Normal loss is 8% of the total input (opening stock plus units put in)

(10) Scrap value is Rs. 4 per unit.

You are required to :

(a) Compute equivalent production,

(b) Calculate the cost per equivalent unit for each element.

(c) *Calculate the cost of abnormal loss (or gain), closing work in process and the units transferred to the next process using the FIFO method,*

(d) *Show the Process Account for February 1990*

Answer

(a) Statement of Equivalent Production (FIFO Method)

			Material		*Labour*		*Overheads*	
Input (Units)	*Output*	*Unit*	*% Completion*	*Units*	*% Completion*	*Units*	*% Completion*	*Units*
800	Opening stock of WIP	800	—	—	40	320	40	320
9,200	Finished	7,100	100	7,100	100	7,100	100	7,100
	Closing WIP	900	100	900	70	630	70	630
	Normal Loss	800	—	—	—	—	—	—
	Abnormal Loss	400	100	400	80	320	80	320
				8,400		8,370		8,370

(b) Statement of Cost per equivalent units

Elements		*Cost*	*Equivalent production (Units)*	*Cost per equivalent Unit*
	Rs.	*Rs.*		*Rs.*
Material Cost	36,800			
Less: Scrap realisation 800 units @ Rs. 4/- p.u.	3,200	33,600	8,400	4/-
Labour cost		16,740	8,370	2/-
Overhead Cost		8,370	8,370	1/-
Total Cost				

(c) Cost of Abnormal Loss – 400 Units

	Rs.
Material cost of 400 equivalent units @ Rs. 4/- p.u.	1,600
Labour cost of 320 equivalent units @ Rs. 2/- p.u.	640
Overhead cost of 320 equivalent units @ Rs. 1/- p.u.	320
	2,560
Cost of closing WIP – 900 Units	
Material cost of 900 equivalent units @ Rs. 4/- p.u.	3,600

Labour cost of 630 equivalent units @ Rs.2/- p.u.		1,260
Overhead cost of 630 equivalent @ Rs. 1/- p.u.		630
		5,490
Cost of 7,900 units transferred to next process		
(i)	Cost of opening WIP Stock b/f – 800 units	4,000
(ii)	Cost incurred on opening WIP stock	
	Material cost	—
	Labour cost 320 equivalent units @ Rs. 2/- p.u.	640
	Overhead cost 320 equivalent units @ Rs. 1/- p.u.	320
		960
(iii)	Cost of 7,100 completed units	
	7,100 units @ Rs.7/- p.u.	49,700
	Total cost [(i) + (ii) + (iii))]	54,660

(d) Process Account for February, 1990

	Units	*Rs.*		*Units*	*Rs.*
To Opening WIP Stock	800	4,000	By Cost of Finished goods	7,900	54,660
To Materials	9,200	36,800			
To Labour		16,740	By Closing WIP	900	5,490
To Overhead		8,370	By Abnormal Loss	400	2,560
			By Normal Loss	800	3200
	10,000	65,910		10,000	65..910

Question 14

A company manufactures a product which involves two consecutive processes, viz. Pressing and Polishing. For the month of October, 1991, the following information is available:

	Pressing	*Polishing*
Opening Stock	—	—
Input of units in process	*1,200*	*1,000*
Units completed	*1,000*	*500*
Units under process	*200*	*500*
Materials Cost	*Rs., 96,000*	*Rs. 8,000*
Conversion Cost	*Rs. 3,36,000*	*Rs. 54,000*

For incomplete units in process, charge materials cost at 100 percent and conversion cost at 60 percent in the Pressing Process and 50 percent in Polishing Process. Prepare a statement of cost and calculate the selling price per unit which will result in 25 percent profit on sale price.

Answer

Statement of Cost

(i) *Pressing process:*

Elements of cost	*Cost* *Rs.*	*Equivalent Production Units (Refer to Working Note 1)*	*Cost per unit (Rs.)*
Material cost	96,000	1,200	80
Conversion cost	3,36,000	1,120	300
Total			380

Cost of 1,000 completed units @ Rs. 380/- p.u. = Rs. 3,80,000

Cost of 200 units under Work-in-Process:

Material cost = 200× Rs. 80 = Rs. 16,000

Conversion cost = 120 × Rs. 300 = Rs. 36,000

Total = Rs. 52,000

(ii) *Polishing Process*

Element of cost		*Cost* *Rs.*	*Equivalent Production Units (Refer to Working Note 1)*	*Cost per unit (Rs.)*
Cost of units introduced (Rs.)	3,80,000			
Material cost (Rs.)	8,000	3,88,000	1,000	388
Conversion cost		54,000	750	72
				460

Total Cost of 500 completed units @ Rs. 460 p.u. = Rs. 2,30,000

Material cost = 500 × Rs. 388 = Rs. 1,94,000

Conversion cost = 250 × Rs. 72 = Rs. 18,000

Total = Rs. 2,12,000

Selling price per unit

Cost per unit	Rs. 460.00
Profit @ 25% on sale price	Rs. 153.33
Or 33 $\frac{1}{3}$ % on cost	
Selling price (p.u.)	Rs. 613.33

Working Note

1. **Statement of equivalent production of pressing process:**

Input (Units)	*Output*	*Units*	*Equivalent units*			
			Material		*Conversion*	
			Qty. (Units)	*%*	*Qty. (Units)*	*%*
1,200	Completed	1,000	1,000	100	1,000	100
	Work in process	200	200	100	120	60
1,200		1,200	1,200		1,120	

2. **Statement of equivalent production of polishing process**

Input (Units)	*Output*	*Units*	*Equivalent units*			
			Material		*Conversion*	
			Qty. (units)	*%*	*Qty. (units)*	*%*
1,000	Completed	500	500	100	500	100
	Work in process	500	500	100	250	50
1,000		1,000	1,000		750	

Question 15

A product passes through three processes – A, B and C. The details of expenses incurred on the three processes during the year 1992 were as under:

Process	*A*	*B*	*C*
Units issued / introduced cost per unit Rs. 100	*10,000*		
	Rs.	*Rs.*	*Rs.*
Sundry Materials	*10,000*	*15,000*	*5,000*
Labour	*30,000*	*80,000*	*65,000*
Direct Expenses	*6,000*	*18,150*	*27,200*
Selling price per unit of output	*120*	*165*	*250*

Management expenses during the year were Rs. 80,000 and selling expenses were Rs. 50,000 These are not allocable to the processes.

Actual output of the three processes was:

A – 9,300 units, B-5, 400 units and C-2, 100 units. Two third of the output of Process A and one half of the output of Process B was passed on to the next process and the balance was sold. The entire output of process C was sold.

The normal loss of the three processes, calculated on the input of every process was:

Process A-5%; B-15% and C-20%

The Loss of Process A was sold at Rs. 2 per unit, that of B at Rs. 5 per unit and of Process C at Rs. 10 per unit.

Prepare the Three Processes Accounts and the Profit and Loss Account.

Answer

Process A Account

Dr.					*Cr.*
Particulars	*Units*	*Rs.*	Particulars	*Units*	*Rs.*
To Units brought in *(Rs.100×10,000)*	10,000	10,00,000	By Normal Loss *(5% of 10,000 units*	500	1,000
To Sundry Materials		10,000	*@ Rs. 2/- p.u.)*		
To Labour		30,000	By Abnormal loss	200	22,000
To Direct expenses		6,000	*(Working note 1)*		
			Process B A/c *(Output to be transferred Rs. 110 × 6,200) (Working Note 1)*	6,200	6,82,000
			By Profit & Loss A/c *(Rs. 100 × 3,100 units) (Working Note 1)*	3,100	3,41,000
	10,000	10,46,000		10,000	10,46,000

Process B Account

Dr.					*Cr.*
Particulars	*Units*	*Rs.*	*Particulars*	*Units*	*Rs.*
To Process A A/c	6,200	6,82,000	By Normal Loss	930	4,650
To Sundry Materials		15,000	*(15% of 6,200 Units*		
To Labour		80,000	*= 930 units*		

To Direct expenses		18,150	*@ Rs. 5/- p.u.)*		
To Abnormal gain *(Working Note 2)*	130	19,500	By Process C A/c *(Output to be transferred) Rs. 150 × 2,700 (Working Note 2)*	2,700	4,05,000
			By Profit & Loss A/c *(Rs. 150 × 2,700)*	2,700	4,05,000
	6,330	8,14,650		6,330	8,14,650

Process C Account

Dr. *Cr.*

Particulars	*Units*	*Rs.*	*Particulars*	*Units*	*Rs.*
To Process B A/c	2,700	4,05,000	By Normal Loss *(20% of 2,700 units = 540 units @ Rs. 10/- p.u.)*	540	5,400
To Sundry Materials		5,000			
To Labour		65,000			
To Direct expenses		27,200			
			By Abnormal Loss *(Working Note 3)*	60	13,800
			By Profit & Loss A/c *(Rs.230 × 2,100 units) (Working Note 3)*	2,100	4,83,000
	2,700	5,02,200		2,700	5,02,200

Profit & Loss Account

Dr. *Cr.*

Particulars	*Units*	*Rs.*	*Particulars*	*Units*	*Rs.*
To Process A A/c	3,100	3,41,000	By Sale	3,100	3,72,000
To Process B A/c	2,700	4,05,000	*(Process A's Output*		
To Process C A/c	2,100	4,83,000	*@ Rs. 120/- p.m.)*		
To Management			By Sale	2,700	4,45,500
Expenses		80,000	*(Process B's Output*		
To Selling Expenses		50,000	*@ Rs. 165/- p.u.)*		
To Abnormal Loss A/c		34,800	By Sale	2,100	5,25,000

(Working Note 4)			*(Process C's Output @ Rs. 250/- p.u.)*		
			By Abnormal gain A/c *(Working Note 5)*		18,850
			By Net Loss		32,450
7,900	13,93,800			7,900	13,93,800

Working Notes

1. (i) **Per unit cost of normal production under process A:**

$$= \frac{\text{Normal cost of normal output}}{\text{Normal production output}}$$

$$= \frac{\text{Rs.10,46,000} - \text{Rs.1,000}}{\text{9,500 units}} = \text{Rs. 110}$$

(ii) **Value of Abnormal loss under process A:**

Abnormal loss units = Normal production – Actual production

= 9,500 – 9,300 = 200 units

Value of Abnormal Loss

= Per unit cost of normal production × Abnormal loss units

= Rs. 110 × 200 – Rs. 22,000.

2. (i) **Per unit cost of normal production under process B:**

$$= \frac{(\text{Rs.7,95,150} - \text{Rs.4,659})}{5{,}270} = \frac{\text{Rs.7,90,500}}{5{,}270} = \text{Rs.150}$$

(ii) **Value of Abnormal gain under process B:**

Abnormal gain units = Normal loss – Actual loss

= 930 – 800 = 130 units

= Per unit cost of normal production × Abnormal gain units

= Rs. 150 × 130 units = Rs. 19,500.

3. (i) **Per unit cost of normal production under process C:**

$$= \frac{(\text{Rs.5,02,200} - \text{Rs.5,400})}{2{,}160\,\text{units}} = \frac{\text{Rs.4,96,800}}{2{,}160\ \text{units}} = \text{Rs.230}$$

(ii) **Value of Abnormal loss under process C:**

Abnormal loss units

= Normal production – Actual production

= 2,160 units – 2,100 units = 60 units

= Rs. 230 × 60 units = Rs. 13,800

4. **Abnormal Loss Account**

Dr. *Cr.*

	Units	*Cost p.u. Rs.*	*Amount Rs.*	Particulars	*Units*	*Cost p.u. Rs.*	*Amount Rs.*
To Process A A/c	200	110	22,000	By Sale proceeds of Process A Loss	200	2	400
To Process C A/c	60	230	13,800	By Sale proceeds of Process C loss	60	10	600
				By Profit & Loss A/c			34,800
	260		35,800		260		35,800

5. **Abnormal Gain Account**

Dr. *Cr.*

	Units	*Cost p.u. Rs.*	*Amount Rs.*	Particulars	*Units*	*Cost p.u. Rs.*	*Amount Rs.*
To Normal loss shortfall	130	5	650	By Process B	130	150	19,500
To Profit & Loss A/c			18,850				
			19,500				19,500

Question 16

Following data are available for a product for the month of July, 1993.

	Process I	*Process II*
Opening work-in-progress	*NIL*	*NIL*
	Rs.	*Rs.*
Cost Incurred during the month:		
Direct materials	*60,000*	–
Labour	*12,000*	*16,000*
Factory overheads	*24,000*	*20,000*

Units of production:		
Received in Process	*40,000*	*36,000*
Completed and transferred	*36,000*	*32,000*
Closing work-in-progress	*2,000*	*?*
Normal loss in process	*2,000*	*1,500*

Production remaining in Process has to be valued as follows:

Materials	*100%*
Labour	*50%*
Overheads	*50%*

There has been no abnormal loss in Process II

Prepare process accounts after working out the missing figures and with detailed workings.

Answer

Statement of equivalent production units (Process – I)

TABLE 1

Particulars	*Units Introduced*	*Units Out*	*Equivalent Production*			
			Material		*Labour and Overhead*	
			% Completion	*Units*	*% Completion*	*Units*
Units in	40,000					
Units completed and transferred to Process-II		36,000	100	36,000	100	36,000
Normal loss		2,000	—	—	—	—
Closing work-in-progress		2,000	100	2,000	50	1,000
Total	40,000	40,000		38,000		37,000

Computation of cost per equivalent unit for each cost element

TABLE 2

	Total Cost	*Equivalent Units*	*Cost per Equivalent Unit*
	Rs.		*Rs.*
Direct materials	60,000	38,000	1.5780
Labour	12,000	37,000	0.3243
Factory overheads	24,000	37,000	0.6487
Total			2.5519

Process –1 Account

	Units	*Rs.*		*Units*	*Rs.*
To Units introduced *(Direct materials)*	40,000	60,000	By Normal Loss	2,000	NIL
To Labour		12,000	By Process – III transferred *(Refer to Working Note-1)*	36,000	91,869
To Factory overheads		24,000	By Work in-process *(Refer to Working Note 2)*	2,000	4,131
	40,000	96,000		40,000	96,000

Statement of equivalent production units (Process – II)

TABLE 3

Particulars	*Units Introduced*	*Units Out*	*Equivalent Production*			
			Material		*Labour and Overheads*	
			% Completion	*Units*	*% Completion*	*Units*
Units transferred from process-I	36,000	32,000	100	32,000	100	32,000
Normal loss	–	1,500	–	–	–	–
Closing work-in-process	–	2,500	100	2,500	50	1,250
	36,000	36,000		34,500		33,250

Computation of cost per equivalent unit for each cost element

TABLE 4

	Total Cost *Rs.*	*Equivalent Units*	*Cost per Equivalent Units* *Rs.*
Cost of 36,000 units transferred from Process – I	91,869	34,500	2.6629
Labour	16,000	33,250	0.4812
Factory overheads	20,000	33,250	0.6015
Total			3.7456

Process-II Account

	Units	*Rs.*		*Units*	*Rs.*
To Units introduced *(Transferred from Process-I)*	36,000	91,869	By Normal Loss	1,500	–
			By Finished stock transferred	32,000	1,19,859
To Labour		16,000	*(Refer to Working Note 3)*		
To Factory overheads		20,000	By Work-in-process *(Refer to Working Note 4)*	2,500	8,010
	36,000	1,27,860		36,000	1,27,869

Working Notes:

1. **Cost of 36,000 completed units in Process – I:**
   - = 36,000 × Cost per unit *(Refer to Table 2)*
   - = 36,000 × Rs. 2.5519 = Rs. 91,869.
2. **Cost of 2,000 units under work-in-process in Process-I:**
   - = Cost of 2,000 equivalent units of material + Cost of 1,000 equivalent units of labour and overheads *(Refer to Tables 1 and 2).*
   - = 2,000 × Rs. 1.5789 + 1,000 × Rs.0.3243 + 1,000 × Rs. 0.6487
   - = Rs. 4,131
3. **Cost of 32,000 units of finished stock in Process-II:**
   - = 32,000 × Cost per unit *(Refer to Table 3)*
   - = 32,000 × Rs. 3.7456 = Rs. 1,19,589
4. **Cost of 2,500 units under work-in-process in Process-II:**
   - = Cost of 2,500 equivalent units of material + Cost of 1,250 equivalent units of labour and overhead *(Refer to Tables 3 and 4)*
   - = 2,500 × Rs. 2.6629 + 1,250 × Rs. 0.4812 + 1,250 × Rs. 0.6015
   - = Rs. 6657.25 + Rs. 601.50 + Rs. 751.88
   - = Rs. 8,010.63.

Question 17

In a manufacturing company, a product passes through 5 operations. The output of the 5th operation becomes the finished product. The input, rejection, output and labour and overheads of each operation for a period are as under:

Operation	*Input (units)*	*Rejection (units)*	*Output (units)*	*Labour and Overhead (Rs.)*
1	*21,600*	*5,400*	*16,200*	*1,94,400*
2	*20,250*	*1,350*	*18,900*	*1,41,750*
3	*18,900*	*1,350*	*17,550*	*2,45,700*
4	*23,400*	*1,800*	*21,600*	*1,40,400*
5	*17,280*	*2,880*	*14,400*	*86,400*

You are required to:

(i) Determine the input required in each operation for one unit of final output.

(ii) Calculate the labour and overhead cost at each operation for one unit of final output and the total labour and overhead cost of all operations for one unit of final output.

(November,1996,8 marks)

Answer

(i) Statement of Input required in each operation for one unit of final output:

(Refer to Working Note)

Operation	*Output (Units)*	*Rejection of output in %*	*Input required*
5	1	20	1.20
			$1 \times \frac{120}{100}$
4	1.20	8.33	1.30
			$1.20 \times \frac{108.33}{100}$
3	1.30	7.69	1.40
			$1.30 \times \frac{107.69}{100}$
2	1.40	7.14	1.50
			$1.40 \times \frac{107.14}{100}$
1	1.50	33.33	2.00
			$1.50 \times \frac{133.33}{100}$

Working Note:

Input required for final output

Operation	*Input (units)*	*Rejection (units)*	*Output (units)*	*Rejection as % of output*	*Input required for final output*
1	21,600	5,400	16,200	33.33	2.00
2	20,250	1,350	18,900	7.14	1.50
3	18,900	1,350	17,550	7,69	1.40
4	23,400	1,800	21,600	8.33	1.30
5	17,280	2,880	14,400	20.00	1.20

(ii) Statement of labour and overhead cost at each operation for one unit of final output

Operation	*Input (Units)*	*Labour & Overheads)*	*Labour & Overhead per unit of input*	*Input units required for one unit of final output*	*Labour and Overhead cost per unit of final output*
	(Rs.)	*(Rs.)*	*(Rs.)*		*(Rs.)*
(a)	(b)	(c)	(d) = (c)/(b)	(e)	(f) = (d)×(e)
1	21,600	1,94,400	9	2.00	18.00
2	20,250	1,41,750	7	1.50	10.50
3	18,900	2,45,700	13	1.40	18.20
4	23,400	140,400	6	1.30	7.80
5	17,280	86,400	5	1.20	6.00
					60.50

Total labour and overhead cost of all operations for one unit of final output is Rs. 60.50

Question 18

From the following information for the month of October, 2003, prepare Process III cost accounts:

Opening WIP in Process III	*1,800 units at Rs. 27,000*
Transfer from Process II	*47,700 units at Rs. 5,36,625*
Transferred to Warehouse	*43,200 units*

Closing WIP of Process III	*4,500 units*
Units scrapped	*1,800 units*
Direct material added in Process III	*Rs. 1,77,840*
Direct Wages	*Rs.87,840*
Production overheads	*Rs. 43,920*

Degree of completion:

	Opening Stock	*Closing Stock*	*Scrap*
Material	*80%*	*70%*	*100%*
Labour	*60%*	*50%*	*70%*
Overheads	*60%*	*50%*	*70%*

The normal loss in the process was 5% of the production and scrap was sold @ Rs. 6.75 per unit. *(November, 2003, 10 marks)*

Answer

Statement of Equivalent Production

(Process III)

Input		*Output*		*Equivalent production*					
				Material A		*Material B*		*Labour & overheads*	
Details	*Quantity Units*		*Quantity units*	*Quantity units*	*%*	*Quantity units*	*%*	*Quantity units*	*%*
Op WIP	1,800	Work on Op. WIP	1,800	–	–	360	20	720	40
Process II Transfer	47,700	Introduced & completed during the month	41,400	41,400	100	41,400	100	41,400	100
		Normal loss *(5% of 45,000 units)*	2,250	–	–	–	–	–	–
		Cl. WIP	4,500	4,500	100	3,150	70	2,250	50
			49,950	45,900		44,910		44,370	
		Abnormal gain	–450	–450	100	–450	100	–450	100
	49,500		49,500	45,450		44,460		43,920	

Working note

Production units:

Production units = Opening units + Units transferred from process II – Closing units

= 1,800 units + 47,700 units – 4,500 units = 45,000 units

Statement of cost

	Cost	*Equivalent*	*Cost per equivalent units*
	Rs.		*Rs.*
	(a)	*(b)*	*(a) / (b)*
Material A	5,36,625		
(Transfer from previous process)			
Less: Scrap value of normal loss *(2,250 units × Rs 6.75)*	15,187		
	5,21,438	45,450	11.4728
Material B	1,77,840	44,460	4.0000
Labour	87,840	43,920	2.0000
Overheads	43,920	43,920	1.0000
	8,31,037.50		18.4728

Statement of apportionment of process cost

			Rs.
Opening WIP	Material A		27,000
Completed opening WIP units – 1,800	Material B	360 units × Rs.4 = Rs. 1,440	
	Wages	720 units × Rs.2 = Rs. 1,440	
	Overheads	720 units × Re. 1 = Rs. 720	3,600
Introduced & completed – 41,400 units		41,400 units × Rs. 18.4728	7,64,773
Total cost of 43,200 finished goods units			7,95,373
Closing WIP Units – 4,500	Material A	4,500 units × Rs. 11.4728	51,628
	Material B	3,150 units × Rs.4	12,600
	Wages	2,250 units × Rs.2	4,500
	Overheads	2,250 units × Re.1	2,250
			70,978
Abnormal gain units – 450		450 units × Rs. 18.4728	8313

Process III A/c

	Units	Rs.		Units	Rs.
To Balance b/d	1,800	27,000	By Normal Loss	2,250	15,187
To Process II A/c	47,700	5,36,625	By Finished goods stock	43,200	7,95,373
To Direct material		1,77,840			
To Direct Wages		87,840			
To Production overheads		43,920	By Closing WIP	4,500	70,978
To Abnormal gain	450	8,313			
	49,950	8,81,538		49,950	8,81,538

Question 19

The following information is given in respect of Process No.3 for the month of January 2001.

Opening stock – 2,000 units made up of

Direct Materials I	*Rs. 12,350*
Direct Materials – II	*Rs. 13,200*
Direct Labour	*Rs. 17,500*
Overheads	*Rs. 11,000*

Transferred from Process No.2: 20,000 units @ Rs. 6.00 per unit

Transferred to Process No.4: 17,000 units

Expenditure incurred in Process No.3

Direct Materials	*Rs. 30,000*
Direct Labour	*Rs. 60,000*
Overheads	*Rs. 60,000*

Scrap 1,000 units – Direct Materials 100%, Direct Labour 60%. Overheads 40%. Normal loss 10% of production.

Scrapped units realised Rs. 4 per unit.

Closing Stock: 4,000 units – Degree of completion: Direct Materials 80%, Direct Labour 60% and overheads 40%.

Prepare Process No.3 Account using average price method, alongwith necessary supporting statements. (May,2001, 10 marks)

Answer

Statement of Equivalent Production
(Average cost method)

Particulars	*Total Unit*	*Material I*		*Material II*		*Labour*		*Overhead*	
		%	*Units*	*%*	*Units*	*%*	*Units*	*%*	*Units*
Units completely processed	17,000	100	17,000	100	17,000	100	17,000	100	17,000
Normal Loss *10% of (2,000 units + 20,000 units – 4,000 units) (Refer to working note)*	1,800	—	—	—	—	—	—	—	—
Abnormal gain	-800	100	-800	100	-800	100	-800	100	-800
Closing stock	4,000	100	4,000	80	3,200	60	2,400	40	1,600
	22,000		20,200		19,400		18,600		17,800

Statement of Cost

	Cost Rs.	*Equivalent Units*	*Rate/Equivalent (Unit) (Rs.)*
Material I:			
Opening balance 2,000 units	12,350		
Cost of 20,000 units @ Rs. 6/- per unit	1,20,000		
Less: Scrap realized *(1,800 units × Rs. 4)*	(7,200)		
	1,25,150	20,200	6,1955
Material II:			
Opening Stock	13,200		
In Process II	30,000		
	43,200	19,400	2.2268
Labour			
Opening labour	17,500		
In Process II	60,000		
	77,500	18,600	4.1667

Overhead:			
Opening stock	11,000		
In Process II	60,000		
	71,000	17,800	3.9888
			16.5778

Statement of Evaluation

Cost of 17,000 finished goods units *(17,000 units × Rs. 16.5778)*			2,81,822.60 or Rs.2,81,822 (say)
Cost of 800 abnormal units *(800 units × Rs. 16.5778)*			13,262.24 or 13,262 (say)
Cost of 4,000 closing work-in-progress units			48,289.92 or 48,290 (say)
			Rs.
Material I	4,000 units × Rs. 6.1955	=	24,782.00
Material II	3,200 units × Rs. 2.2268	=	7,125.76
Labour	2,400 units × Rs. 4.1667	=	10,000.08
Overhead	1,600 units × Rs. 3,988	=	6,382.08
			48,289.92

Process 3 A/c

Dr. *Cr.*

Particulars	*Units*	*Rs.*	*Particulars*	*Units*	*Rs.*
To Opening WIP	2,000	54,050	By Normal Loss	1,800	7,200
To Process 2	20,000	1,20,000	By Finished goods units	17,000	2,81,822
			By Closing balance	4,000	48,290
To Direct Material II		30,000			
To Direct Labour		60,000			
To Overhead		60,000			
To Abnormal gain	800	13,262			
	22,800	3,37,312		22,800	3,37,312

Working Note: Normal loss given is 10% of production. The word production here means those units which come upto the state of inspection. In that case, opening stock plus receipts minus closing stock of WIP will represent units of production (2,000 units + 20,000 units – 4,000 units). In this case the units of production comes to 18,000 units and hence 1,800 units as normal loss units.

Question 20

JKL Limited produces two products – J and K together with a by-product L from a single main process (process I). Product J is sold at the point of separation for Rs. 55 per kg. Whereas product K is sold for Rs. 77 per kg. After further processing into product K2. By-product L is sold without further processing for Rs. 19.25 per kg.

Process I is closely monitored by a team of chemists, who planned the output per 1,000 kg of input materials to be as follows:

Product J	*500 kg*
Product K	*350 kg.*
Product L	*100 kg.*
Toxic waste	*50 kg.*

The toxic waste is disposed at a cost of Rs. 16.50 per kg. And arises at the end of processing.

Process II which is used for further processing of product K into product K2, has the following cost structure:

Fixed costs	*Rs. 2,64,000 per week*
Variable cost	*Rs. 16.50 per kg. processed*

The following actual date relate to the first week of the month:

Process I	
Opening work-in-progress	*NIL*
Material input	*40,000 kg costing Rs. 6,60,000*
Direct Labour	*Rs.4,40,000*
Variable overheads	*Rs. 1,76,000*
Fixed overheads	*Rs. 2,64,000*
Outputs:	
Product J	*19,200 kg.*
Product K	*14,400 kg.*
Product L	*4,000 kg.*
Toxic waste	*2,400 kg.*
Closing work-in-progress	*NIL*

Process II

Opening work-in-progress	*NIL*
Input of product K	*14,400 kg.*
Output of product K2	*13,200 kg.*
Closing work-in-progress (50% converted and conversion costs were incurred in accordance with the planned cost structure)	*1,200 kg.*

Required

(i) Prepare Process I account for the first week of the month using the final sales value method of attribute the pre-separation costs to join products.

(ii) Prepare the toxic waste account and Process II account for the first week of the month.

(iii) Comment on the method used by the JKL Limited to attribute the pre-separation costs to joint products.

(iv) Advise the management of JKL Limited whether or not, on purely financial grounds it should continue to process product K into product K2.

(a) If product K could be sold at the point of separation for Rs. 47.30 per kg; and

(b) If the 60% of the weekly fixed costs of Process II were avoided by not processing product K further. (May,2004, 10 marks)

Answer

(i) Process I account

Particulars	*Qty in Kg.*	*Rate / Kg. Rs.*	*Amount Rs.*	*Particulars*	*Qty in Kg.*	*Rate/ Kg.Rs.*	*Amount Rs.*
To Material input	40,000	16.50	6,60,000	By Product L sales	4,000	19.25	77,000
To Direct Labour			4,40,000	By Normal loss	2,000	(-) 16.50	(-) 33,000
To Variable overheads			1,76,000	By Abnormal Loss*	400	44	17,600
To Fixed overheads			2,64,000	By Joint Product J *(Refer to working note 2)*	19,200		7,21,171
				By Joint product K *(Refer to working note 2)*	14,400		7,67,229
	40,000		15,40,000		40,000		15,40,000

Valuation of abnormal loss per kg. $= \frac{\text{Rs.15,40,000} - \text{Rs.77,000} + \text{Rs.33,000}}{\text{40,000 Kgs.} \times 0.85}$

(Using physical measure method) = Rs. 14,96,000 / 34,000 kgs.

= Rs. 44 per kg.

(ii) Toxic Waste Account

Particulars	*Qty. in Kg.*	*Rate / Kg. Rs.*	*Amount Rs.*	*Particulars*	*Qty. in Kg.*	*Rate/ Kg. Rs.*	*Amount Rs.*
To Process I A/c	2,000	16.50	(-)33,000	By Balance		16.50	(-)33,000

Process II Account

Particulars	*Qty. in Kg.*	*Rate / Kg. Rs.*	*Amount Rs.*	*Particulars*	*Qty. in Kg.*	*Rate/ Kg. Rs.*	*Amount . Rs.*
To Process I A/c (Product K)	14,400	52,585	7,57,236	By Product K_2 account	13,200		11,73,924
To Variable overheads		16.50	2,37,600	By Closing WIP *(Refer to working note 3)*	1,200		84,912
To Fixed overheads			2,64,000				
			12,58,836				12,58,836

Working notes:

1. **Calculation of joint cost of the output:**

   = Rs. 15,40,000 – Rs. 77,000 – Rs. (-) 33,000 – Rs. 17,600

   = Rs. 14,78,400

2. **Allocation of joint cost over joint products J & K**

(By using final sales value method)

Products	*Quantity (Kgs.)*	*Sales Value Rs.*	*Joint Cost Rs.*
J	19,200	10,56,000 *(19,200 kg × Rs. 55)*	7,21,171
K	14,400	11,08,800 *(14,400 kgs x Rs.77)*	7,57,229
Total		21,64,800	14,78,400

3. **Valuation of 1,200 Kgs. of Closing WIP :**

Material I	100% complete	*Rs.*
	(1200 kgs x Rs.52.5858)	63,103
Fixed & variable overheads	$\left(\frac{\text{Rs.5,01,600}}{\text{13,800 units}}\right)$ x 600 units	21,809
Total valuation of 1,200 kgs of closing WIP		84,912

(iii) Comment on the method used by the JKL Ltd :

(To attribute the pre-separation costs to joint products)

For attributing the joint costs over joint products J and K , JKLF Ltd., used the basis of final sales value. This is one of the popular method used in the industry.

Other methods can also be used for the purpose. Some of these are as follows:

- Physical Measure Method (if both the products are equally complex).
- Constant Gross Margin Percentage method.
- Net Realization Value Method.

(iv) Advise to the management of JKL Ltd.:

	Rs.
Incremental sales revenue per kg. from further processing	29.70
Less: Incremental variable cost per kg. of further processing	16.50
Incremental contribution per kg from further processing	13.20
At an output of 14,400 kgs the incremental contribution is:	1,90,080
Less: Avoidable fixed cost	1,58,400
(60% x Rs. 2,64,000)	———
Net benefit (Rs.)	31,680

$$\text{Break-even point} = \frac{\text{Avoidable fixed costs}}{\text{Incremental contribution per kg.}} = \frac{\text{Rs..1,58,400}}{\text{Rs.13.20}}$$

= 12,000 kgs.

Hence further processing should be undertaken if output is expected to exceed 12,000 kgs. per week.

Question 21

A product passes through two processes. The output of Process I becomes the input of Process II and the output of Process II is transferred to warehouse. The quantity of raw

materials introduced into Process I is 20,000 kg. at Rs. 10 per kg. The cost and output data for the month under review are as under:

	Process I	*Process II*
Direct Materials	*Rs. 60,000*	*Rs. 40,000*
Direct Labour	*Rs. 40,000*	*Rs. 30,000*
Production overheads	*Rs. 39,000*	*Rs. 40,250*
Normal Loss	*8%*	*5%*
Output	*18,000*	*17,400*
Loss realisation of Rs. / Unit	*2.00*	*3.00*

The company's policy is to fix the Selling price of end product is such a way as to yield a Profit of 20% on Selling price.

Required

(i) Prepare the Process Accounts

(ii) Determine the Selling price per unit of the end product. *(November,2002, 9 marks)*

Answer

(i) **Process I Account**

Dr. *Cr.*

	Kgs.	*Rate / Kg.*	*Amount*	*Particulars*	*Kgs.*	*Rate/ Kg.*	*Amount.*
		Rs.	*Rs.*			*Rs.*	*Rs.*
To Raw material	20,000	10	2,00,000	By Normal loss	1,600	2.00	3,200
To Direct material			60,000	By Abnormal	400	18.25	7,300
To Direct labour			40,000	loss *(Refer to working notes 1 & 2)*			
To Production overheads	_____		39,000	By Transfer to Process II	18,000	18.25	3,28,500
	20,000		3,39,000		20,000		3,39,000

Process II Account

Dr. *Cr.*

	Kgs.	*Rate / Kg.*	*Amount*	*Particulars*	*Kgs.*	*Rate/ Kg.*	*Amount*
		Rs.	*Rs.*			*Rs.*	*Rs.*
To Process I Account	18,000	18.25	3,28,500	By Normal loss	900	3.00	2.700

To Direct materials			40,000	By Transfer to warehouse	17,400	25.50	4,43,700
To Direct labour			30,000				
To Production overheads			40,250				
To Abnormal gain	300	25.50	7,650				
(Refer to working notes 3 & 4)	18,300		446400		18300		446400

Working notes

1. **Abnormal loss in Process I:**

Required production (20,000 kgs. – 1,600 kgs.)	18,400
Actual production (in kgs.)	18,000
Abnormal loss (in kgs.)	400

2. **Value of abnormal loss in Process I:**

$$= \left(\frac{\text{Normal cost of normal output}}{\text{Normal output}}\right) \times \text{Abnormal loss.}$$

$$= \left(\frac{\text{Rs.3,35,800}}{\text{18,400 kgs.}}\right) \times 400 \text{ kgs.} = \text{Rs. } 18.25 \times 400 \text{ kgs.} = 7,300$$

3. **Abnormal gain in Process II:**

Required production (18,000 kgs. – 900 kgs.)	17,100
Actual production	17,400
Abnormal gain (in kgs.)	300

(4) **Value of abnormal gain in Process I:**

$$= \left(\frac{\text{Rs.4,36,050}}{\text{17,100 kgs}}\right) \times 300 \text{ Kgs.} = \text{Rs. } 25.50 \times 3{,}000 \text{ kgs.} = \text{Rs.}7{,}650.00$$

(ii) Determination of selling price of the end product:

If the cost price of end product is Rs. 80 the units S.P. is Rs. 100

If the cost price of end product is Re.1, the unit S.P. is $\frac{100}{80}$

If the cost price is Rs. 25.50, then the S.P. of the end product is $\frac{100}{80} \times 25.50$

$$= \text{Rs. } 31.875$$

Question 22

RST Ltd. manufactures plastic moulded chairs. Three models of moulded chairs, all variation of the same design are Standard, Deluxe and Executive. The company uses an operation-costing system.

RST Ltd. has extrusion, form, trim and finish operations. Plastic sheets are produced by the extrusion operation. During the forming operation, the plastic sheets are moulded into chair seats and the legs are added. The standard model is sold after this operation. During the trim operation, the arms are added to the Deluxe and Executive models and the chair edges are smoothed. Only the executive model enters the finish operation, in which padding is added. All of the units produced receive the same steps within each operation. In April, 2003 units of production and direct material cost incurred are as follows:

	Units Produced	Extrusion Materials (Rs.)	Form Materials (Rs.)	Trim Materials (Rs.)	Finish Materials (Rs.)
Standard Model	10,500	1,26,000	42,000	0	0
Deluxe Model	5,250	63,000	21,000	15,750	0
Executive Model	3,500	42,000	14,000	10,500	21,000
	19,250	2,31,000	77,000	26,250	21,000

The total conversion costs for the month of April, 2003 are:

	Extrusion Operation	Form Operation	Trim Operation	Finish Operations
Total conversion costs	Rs. 6,06,375	Rs. 2.97,000	Rs. 1,55,250	Rs. 94,500

Required:

(i) For each product produced by RST Ltd. during April.2003, determine the unit cost and the total cost

(i) Now consider the following information for May. All unit costs in May are identical to the . April unit costs calculated as above in (i). At the end of May, 1,500 units of the Deluxe model remain in work-in-progress. These units are 100% complete as to materials and 65 % complete in the trim operation. Determine the cost of the Deluxe model work-in-process inventory at the end of May. (May,2003, 6+3=9 marks)

Answer

Working notes:

1. **Statement of equivalent production units of Extrusion, Form, Trim and Finish**

materials for Standard, Deluxe and Executive model of chairs.

	Extrusion materials units	*Form materials units*	*Trim materials units*	*Finish materials units*
Equivalent units of materials required to produce three brands of plastic moulded chairs	19,250	19,250	8,750	3,500

2. **Statement of material and conversion cost per equivalent unit:**

	Extrusion	*Form*	*Trim*	*Finish*
Equivalent units: (A) *(Refer to working note 1)*	19,250	19,250	8,750	3,500
Material costs (Rs.): (B)	2,31,000	77,000	26,250	21,000
Conversion costs of different operations performed on material (Rs.) : (C)	6,06,375	2,97,000	1,55,250	94,500
Material cost per equivalent unit (Rs.): (B/A)	12	4	3	6
Conversion cost per equivalent unit (Rs.): (C/A)	31.50	15.43	17.74	27

(i) Statement of Unit and Total cost Model-wise

(Refer to working notes 1 & 2)

	Standard Model cost	*Deluxe Model Cost*	*Executive Model*
	Rs.	*Rs.*	*Rs.*
Extrusion material	12.00	12.00	12.00
Form material	4.00	4.00	4.00
Trim material	–	3.00	3.00
Finish material	-	-	6..00
Extrusion conversion	31.50	31.50	31.50
Form conversion	15.43	15.43	15.43
Trim conversion	–	17.74	17.74
Finish conversion	–	–	27
Total unit cost	62.93	83.67	116.67
Total Cost	6,60,765 *(10,500 units×Rs.62.93)*	4,39,267.5 *(5,250 units × Rs.83.67)*	4,08,345 *(3,500 units × Rs.116.67)*

(ii) Statement of cost of 1,500 units of the Deluxe Model of the chairs lying in Work-in-progress inventory at the end of May 2003

	Equivalent units	*Unit cost (Refer to working note 2)* Rs.	*Total Cost*
	(1)	*(2)*	*(3)=(1) × (2)*
Extrusion materials	1,500	12	18,000
Form materials	1,500	4	6,000
Trim materials	1,500	3	4,500
Extrusion materials conversion	1,500	31.50	47,250
Form materials conversion	1,500	15.43	23,145
Trim materials conversation *(1,500 units × 65%)*	975	17.74	17,296.50
Total cost of 1,500 units of Delux Model of chairs lying in WIP			1,16,191.50

Question 23

Process 2 receives units from Process I and after carrying out work on the units transfers them to Process 3. For the accounting period the relevant data were as follows:

Opening WIP 200 units (25% complete) valued at *Rs. 5,000*

800 Units received from Process I valued at *Rs. 8,600*

840 units were transferred to Process 3

Closing WIP 160 units (50% complete)

The costs of the period were Rs. 33.160 and no units were scrapped.

Required:

Prepare the process Account for Process 2 using the Average Cost method of valuation.

(November,1995, 6 marks)

Answer

Process 2 Account

	Units	*Rs.*		*Units*	*Rs.*
To Opening WIP	200	5,000	By Transfer to Process 3 *(Refer to W. note No.3)*	840	42,694
To Process 1 A/c	800	8,600			
To Process Cost		33,160			
			By Closing WIP	160	4,066

					(Refer to W. note No.3)			
		1,000		46,760			1,000	46,700

Working Notes

1. **Computation of Equivalent Units**

Units In	*Particulars*	*Units out*	*Equivalent Production*					
			Material		*Labour and*		*Overhead*	
			% Comp-letion	*Units*	*% Comp-letion*	*Units*	*% Comp-letion*	*Units*
1000	Completed units	840	100	840	100	840	100	840
	WIP	160	50	80	50	80	50	80
1000		1000		920		920		920

2. Average cost per completed units

	Rs.
Cost of 200 opening WIP units	5,000
Cost of 800 units received from Process I	8,600
Cost of the period	33,160
Total cost	46,760

Equivalent units = 920

(Refer to Working Note No.1)

Average cost per completed unit = $\frac{\text{Rs.46,760}}{\text{920 units}}$ = Rs. 50.826

		Rs.
3.	Cost of 840 completed units transferred to Process 3 *(840 units × Rs. 50,826)*	42,694
	Cost of 160 WIP units which are 50% complete *(80 units × Rs. 50,826)*	4,066

Question 24

The input to a purifying process was 16,000 kgs. of basic material purchased @ Rs. 1.20 per kg. Process wages amounted to Rs.720 and overhead was applied @ 240% of the labour cost. Indirect materials of negligible weight were introduced into the process at a cost of Rs. 336. The actual output from the process weighed 15,000 kgs. The normal yield of the process is 92%. Any difference in weight between the input of basic material and output of purified material (product) is sold @ Re. 0.50 per kg.

The process is operated under a licence which provides for the payment of royalty @ Re.0.15 per kg. of the purified material produced.

Prepare:

(i) Purifying Process Account (3 marks)

(ii) Normal Wastage Account (3 marks)

(iii) Abnormal Wastage / Yield Account (May, 1996, 2 marks)

(iv) Royalty Payable Account (1 marks)

Answer

(i) Purifying Process Account

Dr. *Cr.*

	Qty. *kg.*	*Rate per kg.* *Rs.*	*Amount* *Rs.*		*Qty.* *kg.*	*Rate per kg.* *Rs.*	*Amount* *Rs.*
To Basic material	16,000	1.20	19,2000	By Normal wastage 8% of 1,60,000 Kg.	1,280	0.50	640.00
To Wages			720				
To Overheads *240% of Rs. 720*			1,728	By Purified stock	15,000	1.60	24,000
To Indirect materials			336				
To Royalty payable on normal yield *14,720 kg × 0.15*			2,208				
To Abnormal yield	280	1.60	448				
	16,280		24,640		16,280		24,640

(ii) Normal Wastage Account

Dr.							*Cr.*
	Qty.	*Rate per kg.*	*Amount*	Particulars	*Qty.*	*Rate per kg.*	*Amount*
	kg.	*Rs.*	*Rs.*		*Kg.*	*Rs.*	*Rs.*
To Purifying process (Normal wastage)	1,280	0.50	640	By Purifying Process (Ab. Yield) reduction	280	0.50	140
				By Cash sale of wastage	1,000	0.50	500
	1,280		640		1,280		640

(iii) Abnormal Yield Account

Dr.							*Cr.*
	Qty.	*Rate per kg.*	*Amount*	Particulars	*Qty.*	*Rate per kg.*	*Amount*
	kg.	*Rs.*	*Rs.*		*kg.*	*Rs.*	*Rs.*
To Normal Wastage A/c	280	0.50	140	By Purifying Process A/c	280	1.60	448
To Royalty payable (on abnormal yield)		0.15	42				
To Balance (Profit & Loss A/c			266				
	280		448		280		448

(iv) Royalty Payable Account

Dr.							*Cr.*
	Qty.	*Rate per kg.*	*Amount*	Particulars	*Qty.*	*Rate per kg.*	*Amount*
	kg.	*Rs.*	*Rs.*		*kg.*	*Rs.*	*Rs.*
To Balance	15,000	0.15	2,250	By Purifying Process A/c	14,720	0.15	2,208
				By Abnormal yield A/c	280	0.15	42
	15,000		2,250		15,000		2,250

Question 25

The following data relate to Process Q

(i) Opening work-in-process 4,000 units

Degree of completion:

Materials	*100%*	*Rs. 24,000*
Labour	*60%*	*Rs. 14,400*
Overheads	*60%*	*Rs. 7,200*

(ii) Received during the month of April, 1998 from process P.

40,000 Units.	*Rs. 1,71,000*

(iii) Expenses incurred in Process Q during the month:

Material	*Rs. 79,000*
Labour	*Rs. 1,38,230*
Overheads	*Rs. 69,120*

(iv) Closing work-in-process *3,000 units*

Degree of completion:

Material	*100%*
Labour & Overheads	*50%*

(v) Units scrapped *4,000 units*

Degree of completion:

Materials	*100%*
Labour & Overheads	*80%*

(vi) Normal loss: 5% of current input.

(vii) Spoiled goods realised Rs. 1.50 each on sale.

(viii) Completed units are transferred to warehouse;

Required

Prepare:

(i) Equivalent units statement

(ii) Statement of cost per equivalent unit and total costs.

(iii) Process Q Account

(iv) Any other account necessary *(May, 1998,12 marks)*

Answer

(i) Equivalent units Statement (using FIFO method)

Units in	*Particulars*	*Units out*	*Equivalent Production*					
			Materials		*Labour*		*Overheads*	
			% comple-tion	*Units*	*% comple-tion*	*Units*	*% comple-tion*	*Units*
4,000	Opening work in-progress units, completed and transferred to warehouse	4,000	—	—	40	1,600	40	1,600
40,000	Units completed and transferred to warehouse	33,000	100	33,000	100	33,000	100	33,000
	Closing work-in progress	3,000	100	3,000	50	1,500	50	1,500
	Normal loss	2,000	—	—	—	—	—	—
	Abnormal loss	2,000	100	2,000	80	1,600	80	1,600
				38,000		37,700		37,700

(ii) Statement of Cost per equivalent unit and total cost

	Previous Process P	*Current process Q*		*Total*
		Material	*Labour and overheads*	
Costs (Rs.)	1,71,000	79,000	2,07,350	
Less: Recovery from the sale of 2,000 units @ Rs.1.50 p.u. of normal loss (Rs.)		–3,000		
	1,71,000	76,000	2,07,350	
Equivalent units:		38,000	37.700	

Cost per equivalent unit (Rs.)	6.50	5.50	12.00
	$\left(\frac{\text{Rs.1,71,000}+\text{Rs.76,000}}{38,000}\right)$	$\frac{\text{Rs.2,07,350}}{37,700}$	

Total cost of 37,000 completed units transferred to warehouse.	
Cost of 4,000 completed opening units (Rs.)	54,400
(Rs. 45,600 + Rs. 8,800)	
(1,600 units × Rs. 5.50)	
Cost of 33,000 completed units (Rs.)	3,96,000
(33,000 units × Rs. 12)	
Total cost of 37,000 completed units (Rs.)	4,50,400
Cost of 3,000 Closing W.I.P. Units (Rs.)	27,750
(Rs. 19,500 + Rs. 8,250)	
{ (3,000 units × Rs. 6.50) + (1,500 units × Rs. 5.50) }	
Cost of 2,000 abnormal loss unit (Rs.)	21,800
(Rs. 13,000 + Rs. 8,800)	Rs. 4,99,950

(iii) Process Q Account

Dr. *Cr.*

Particulars	*Units*	*Rs.*	*Particulars*	*Units*	*Rs.*
To Op. W.I.P.	4,000	45,600	By Normal loss	2,000	3,000
To Units received	40,000	1,71,000	By Completed units *(Refer to (ii) Part)*	37,000	4,50,400
To Expenses incurred			By Cl. W.I.P.	3,000	27,750
Materials		79,000	*(Refer to (ii) part)*		
Labour		1,38,230	By Abnormal Loss	2,000	21,800
Overheads		69,120	*(Refer to (ii) part)*		
	44,000	5,02,950		44,000	5,02,950

(iv) Any other account necessary is abnormal loss account:

Abnormal Loss Account

Dr. *Cr.*

Particulars	*Units*	*Amount Rs.*	*Particulars*	*Units*	*Amount Rs.*
To Process Q Account	2,000	21,800	By Sale	2,000	3,000
			By Balance (To Profit & Loss A/c)		18,800
		21,800			21,800

Question 26

Following information is available regarding process A for the month of February, 1999:

Production Record.

Units in process as on 1.2.1999	*4,000*
(All materials used, 25% complete for labour and overhead)	
New units introduced	*16,000*
Units completed	*14,000*
Units in process as on 28.2.1999	*6,000*
(All materials used, 33-1/3% complete for labour and overhead)	

Cost Records

Work-in-process as on 1.2.1999	*Rs.*
Materials	*6,000*
Labour	*1,000*
Overhead	*1,000*
	8,000
Cost during the month	
Materials	*25,600*
Labour	*15,000*
Overhead	*15,000*
	55,600

Presuming that average method of inventory is used, prepare:

(i) Statement of equivalent production.

(ii) Statement showing cost for each element.

(iii) Statement of apportionment of cost.

(iv) Process cost account for process A. *(May, 1999,10 marks)*

Answer

(i) Statement of equivalent production (Average cost method)

Particulars			*Equivalent Production*					
Input (Units)	*Output*	*Units*	*Materials*		*Labour*		*Overheads*	
			% comple-tion	*Equi-valent units*	*% comple-tion*	*Equi-valent units*	*% comple-tion*	*Equi-valent units*
20,000	Completed	14,000	100	14,000	100	14,000	100	14,000
_____	WIP	6,000	100	6,000	33-1/3	2,000	33-1/3	2,000
20,000		20,000		20,000		16,000		16,000

(ii) Statement showing cost for each element

Particulars	*Materials*	*Labour*	*Overhead*	*Total*
Cost of opening work-in-progress (Rs.)	6,000	1,000	1,000	8,000
Cost incurred during the month (Rs.)	25,600	15,000	15,000	55,600
Total cost (Rs.) : (A)	31,600	16,000	16,000	63,600
Equivalent units : (B)	20,000	16,000	16,000	
Cost per equivalent unit (Rs.) : C=(A/B)	1.58	1	1	3.58

(iii) Statement of apportionment of cost

		Rs.	*Rs.*
Value of output transferred: (a)	14,000 units @ Rs. 3.58		50,120
Value of closing work-in-progress: (b)			
Material	6,000 units @ Rs. 1.58	9,480	
Labour	2,000 units @ Re. 1	2,000	
Overhead	2,000 units @ Re. 1	2,000	13,480
Total cost : (a+b)			63,600

(iv) Process cost account for process A:

Process A Cost Account

	Units	*Rs.*		*Units*	*Rs.*
To Opening WIP	4,000	8,000	By Completed units	14,000	50,120
To Materials	16,000	25,600	By Closing WIP	6,000	13,480
To Labour		15,000			
To Overhead		15,000			
	20,000	63,600		20,000	63,600

Quotation 27

Explain briefly the procedure for the valuation of Work-in-process.

(November,2002, 2 marks)

Answer

Valuation of Work-in process:

The valuation of work-in-process can be made in the following three ways, depending upon the assumptions made regarding the flow of costs.

- First-in-first out (FIFO) method
- Last-in-first out (LIFO) method
- Average cost method

A brief account of the procedure followed for the valuation of work-in-process under the above three methods is as follows;

FIFO method: According to this method the units first entering the process are completed first. Thus the units completed during a period would consist partly of the units which were incomplete at the beginning of the period and partly of the units introduced during the period.

The cost of completed units is affected by the value of the opening inventory, which is based on the cost of the previous period. The closing inventory of work-in-process is valued at its current cost.

LIFO method: According to this method units last entering the process are to be completed first. The completed units will be shown at their current cost and the closing-work in process will continue to appear at the cost of the opening inventory of work-in-progress along with current cost of work in progress if any.

Average cost method: According to this method opening inventory of work-in-process and its costs are merged with the production and cost of the current period, respectively. An average cost per unit is determined by dividing the total cost by the total equivalent units, to ascertain the value of the units completed and units in process.

Question 28

Explain equivalent units *(May, 2002, 2 marks)*

Answer

When opening and closing stocks of work-in-process exist, unit costs cannot *be* computed by simply dividing the total cost by total number of units still in process. We can convert the work-in-process units into finished units called equivalent units so that the unit cost of these units can be obtained.

$$\text{Equivalent completed units} = \text{Actual number of units in the process of manufacture} \times \text{Percentage of work completed}$$

It consists of balance of work done on opening work-in-process, current production done fully and part of work done on closing WIP with regard to different elements of costs viz., material, labour and overhead.

Question 29

From the following Information for the month ending October, 2005, prepare Process Cost accounts for Process III. Use First-in-fist-out (FIFO) method to value equivalent production.

Direct materials added in Process III (Opening WIP)	*2,000 units at Rs. 25,750*
Transfer from Process II	*53,000 units at Rs. 4,11,500*
Transferred to Process IV	*48,000 units*
Closing stock of Process III	*5,000 units*
Units scrapped	*2,000 units*
Direct material added in Process III	*Rs. 1,97,600*
Direct wages	*Rs. 97,600*
Production Overheads	*Rs. 48,800*

Degree of completion:

	Opening Stock	*Closing Stock*	*Scrap*
Materials	*80%*	*70%*	*100%*
Labour	*60%*	*50%*	*70%*
Overheads	*60%*	*50%*	*70%*

The normal loss in the process was 5% of production and scrap was sold at Rs. 3 per unit. *(14 Marks)*

Answer

Process III **Process Cost Sheet** **Period……..**

(FIFO Method)

Op. Stock : 2000 units

Introduced : 53000 units

Statement of Equivalent Production

Input		**Output**		**Equivalent production**					
Item	**Units**	**Item**	**Units**	**Material A**		**Material B**		**Labour & OHs.**	
Op stock	2,000	Work on op WIP	2,000	-	-	400	20	800	40
Process		Introduced &							

II transfer	53,000	completed during the period (48,000 – 2000)	46,000	46,000	100	46,000	100	46,000	100
			48,000						
		Normal Loss (2000+53000 – 5000) x 5%	2,500	-	-	-	-	-	-
	55,000	Cl WIP	5,000	5,000	100	3,500	70	2,500	50
			55,500	51,000		49,900		49,300	
		Ab. Gain	500	500	100	500	100	500	100
			55,000	50,500		49,400		48,800	

Statement of Cost for each Element

Element of cost		Cost (Rs.)	Equivalent Production.	Cost per unit Rs.
Material A				
	Transfer from previous. Process	4,11,500		
	Less: Scrap value of Normal Loss 2500 × Rs. 3	7,500		
		4,04,000	50,500	8
Material B		1,97,600	49,400	4
Wages		97,600	48,800	2
Overheads		48,800	48,800	1
		7,48,000		15

Process Cost Sheet (in Rs)

Op WIP (for completion)	Mat B	400×Rs. 4	=	1,600
	Wages	800× Rs. 2	=	1,600
	OHs.	800× Re. 1	=	800
				4,000
Introduced and completely processed during the period		46000× Rs. 15	=	Rs. 6,90,000
Closing WIP	Mat A	5,000×8	=	40,000
	Mat B	3,500×4	=	14,000
	Wages	2,500×2	=	5,000
	OHs	2,500×1	=	2,500
				61,500
Abnormal Gain		500× Rs. 15	=	7,500

Process III A/c

	Units	Amount		Units	Amount
To bal b/d	2,000	25,750	By Normal Loss	2,500	7,500
To Process II A/c	53,000	4,11,500	By process IV A/c (6,90,000 + 4000 + 25,750)	48,000	7,19,750
To Direct Material		1,97,600	By bal C/d	5,000	61,500
To Direct Wages		97,600			
To Prodn. OHs		48,800			
To Abnormal Gain	500	7,500			
	55,500	7,88,750		55,500	7,88,750

Question 30

A Company produces a component, which passes through two processes. During the month of April, 2006, materials for 40,000 components were put into Process I of which 30,000 were completed and transferred to Process II. Those not transferred to Process II were 100% complete as to materials cost and 50% complete as to labour and overheads cost. The Process I costs incurred were as follows:

Direct Materials	*Rs.15,000*
Direct Wages	*Rs.18,000*
Factory Overheads	*Rs.12,000*

Of those transferred to Process II, 28,000 units were completed and transferred to finished goods stores. There was a normal loss with no salvage value of 200 units in Process II. There were 1,800 units, remained unfinished in the process with 100% complete as to materials and 25% complete as regard to wages and overheads.

No further process material costs occur after introduction at the first process until the end of the second process, when protective packing is applied to the completed components. The process and packing costs incurred at the end of the Process II were:

Packing Materials	*Rs.4,000*
Direct Wages	*Rs.3,500*
Factory Overheads	*Rs.4,500*

Required:

(i) Prepare Statement of Equivalent Production, Cost per unit and Process I A/c.

(ii) Prepare statement of Equivalent Production, Cost per unit and Process II A/c.

Answer 30

Statement of Equivalent Production and Cost

	Material	Labour and Overheads	Total
Units completed	30,000	30,000	
Closing Inventory	10,000	5,000	
Equivalent Production	40,000	35,000	
	Rs	*Rs*	*Rs*
Current Process cost	15,000	30,000	45,000
Cost/unit	0.375	0.8571	
Closing inventory cost	3,750	4,286	8,036
Material transferred to Process II			36,964

Process I Account

	Units	Rs.		Units	Rs.
Direct material	40,000	15,000	Process II A/c	30,000	36,964
Direct wages		18,000	Work-in-progress inventory	10,000	8,036
Factory overheads		12,000			
	40,000	45,000		40,000	45,000

(ii) **Statement of Equivalent Production and Cost**

	Material	Labour and Overheads	Total
Units completed	28,000	28,000	
Closing Inventory	1,800	450	
Equivalent Production	29,800	28,450	
Process cost	36,964	8,000	44,964
Cost/unit	1.24	0.2812	
Closing inventory	2,232	127	2,359
			42,605
Packing material cost			4,000
			Rs. 46,605

Process II Account

		Units	Rs.			Units	Rs.
To	Material transferred from Process I	30,000	36,964	By	Finished goods stores A/c	28,000	46,605
To	Packing Material		4,000	By	WIP stock	1,800	2,359
To	Direct wages		3,500	By	Normal loss	200	–
To	Factory overheads		4,500				
		30,000	48,964			30,000	48,964

Question 31

A Chemical Company carries on production operation in two processes. The material first pass through Process I, where Product 'A' is produced.

Following data are given for the month just ended:

Material input quantity	*2,00,000 kgs.*
Opening work-in-progress quantity	
(Material 100% and conversion 50% complete)	*40,000 kgs.*
Work completed quantity	*1,60,000 kgs.*
Closing work-in-progress quantity	
(Material 100% and conversion two-third complete)	*30,000 kgs.*
Material input cost	*Rs. 75,000*
Processing cost	*Rs. 1,02,000*
Opening work-in-progress cost	
Material cost	*Rs. 20,000*
Processing cost	*Rs. 12,000*

Normal process loss in quantity may be assumed to be 20% of material input. It has no realisable value.

Any quantity of Product 'A' can be sold for Rs. 1.60 per kg.

Alternatively, it can be transferred to Process II for further processing and then sold as Product 'AX' for Rs. 2 per kg. Further materials are added in Process II, which yield two kgs. of product 'AX' for every kg. of Product 'A' of Process I.

Of the 1,60,000 kgs. per month of work completed in Process I, 40,000 kgs are sold as Product 'A' and 1,20,000 kgs. are passed through Process II for sale as Product 'AX'. Process II has facilities to handle upto 1,60,000 kgs. of Product 'A' per month, if required.

The monthly costs incurred in Process II (other than the cost of Product 'A') are:

	1,20,000 kgs. of Product 'A' input	*1,60,000 kgs. of Product 'A' input*
	Rs.	*Rs.*
Materials Cost	*1,32,000*	*1,76,000*
Processing Costs	*1,20,000*	*1,40,000*

Required:

(i) Determine, using the weighted average cost method, the cost per kg. of Product 'A' in Process I and value of both work completed and closing work-in-progress for the month just ended.

(ii) Is it worthwhile processing 1,20,000 kgs. of Product 'A' further?

(iii) Calculate the minimum acceptable selling price per kg., if a potential buyer could be found for additional output of Product 'AX' that could be produced with the remaining Product 'A' quantity. *(6 + 4 + 4 = 14 marks)*

Answer

(i)

Process I
Statement of equivalent production

Inputs		**Output**		**Equivalent output**			
Particulars	**Units**	**Particulars**	**Units**	**Material**		**Conversion**	
	Kg.		*Kg.*	*%*	*Unit kg.*	*%*	*Units kg.*
Opening W.I.P.	40,000	Normal loss	40,000	–	–	–	–
New material introduced	2,00,000	Units introduced & completed	1,60,000	100%	1,60,000	100%	1,60,000
		Abnormal loss	10,000	100%	10,000	100%	10,000
		Closing WIP	30,000	100%	30,000	2/3rd	20,000
	2,40,000		2,40,000		2,00,000		1,90,000

Process I
Statement of cost for each element

Elements of cost	**Costs of opening WIP**	**Costs in process**	**Total cost**	**Equivalent units**	**Cost/Unit (Kg.)**
	Rs.	*Rs.*	*Rs.*	*Kg.*	*Rs.*
Material	20,000	75,000	95,000	2,00,000	0.475
Conversion cost	12,000	1,02,000	1,14,000	1,90,000	0.600
	32,000	1,77,000	2,09,000		1.075

Statement of apportionment of cost

Units completed	Elements	Equivalent units	Cost/unit	Cost	Total cost
			Rs.	*Rs.*	*Rs.*
Work completed	Material	1,60,000	.475	76,000	
	Conversion	1,60,000	.600	96,000	1,72,000
Closing WIP	Material	30,000	.475	14,250	
	Conversion	20,000	.600	12,000	26,250

(ii) Statement showing comparative data to decide whether 1,20,000 kg. of product 'A' should be processed further into 'AX'.

Alternative I – To sell product 'A' after Process – I	*Rs.*
Sales 1,20,000 × 1.60	1,92,000
Less: Cost from Process I 1,20,000 × 1.075	,29,000
Gain	63,000

Alternative II – Process further into 'AX'

Sales 2,40,000 × 2.00		4,80,000
Less:Cost from Process I 1,20,000 × 1.075 =	Rs. 1,29,000	
Material in Process II	= Rs. 1,32,000	
Processing cost in Process II	= Rs. 1,20,000	3,81,000
Gain		99,000

Hence company should process further

It will increase profit by 99,000 – 63,000 = Rs. 36,000

(iii) Calculation of minimum selling price/kg:

Cost of processing remaining 40,000 kg. further	*Rs.*
Material 1,76,000 – 1,32,000	44,000
Processing cost 1,40,000 – 1,20,000	20,000
Cost from process I relating to 40,000 kg. 'A' (40,000 × 1.075)	43,000
Benefit foregone if 40,000 kg. 'A' are further processed	
40,000 (1.60 – 1.075)	21,000
Total cost	1,28,000
Additional quantity of product 'AX' (40,000 × 2)	80,000
∴ Minimum selling price $\left(\frac{1,28,000}{80,000}\right)$ =	Rs. 1.60

Question 32

Following details are related to the work done in Process 'A' of XYZ Company during the month of March, 2007:

Opening work-in-progress (2,000 units)	*Rs.*
Materials	*80,000*
Labour	*15,000*
Overheads	*45,000*
Materials introduced in Process 'A' (38,000 units)	*14,80,000*
Direct labour	*3,59,000*
Overheads	*10,77,000*

Units scrapped: 3,000 units

Degree of completion:

Materials	*100%*
Labour and overheads	*80%*

Closing work-in-progress : 2,000 units

Degree of Completion:

Materials	*100%*
Labour and overheads	*80%*

Units finished and transferred to Process 'B' : 35,000

Normal Loss:

5% of total input including opening work-in-progress

Scrapped units fetch Rs. 20 per piece.

You are required to prepare:

(i) Statement of equivalent production;

(ii) Statement of cost;

(iii) Statement of distribution cost; and

(iv) Process 'A' Account, Normal and Abnormal Loss Accounts. (May 2007, 10 Marks)

Answer

(i) Statement of Equivalent Production

Input	*Units*	*Output*	*Units*	*Equivalent production*			
				Material		*Labour & Overheads*	
				%	*Units*	*%*	*Units*
Opening WIP	2,000	Completed and transfer to Process 'B'	35,000	100	35,000	100	35,000
Units introduced	38,000	Normal loss (5% of 40,000)	2,000		–		–
		Abnormal loss	1,000	100	1,000	80	800
		Closing WIP	2,000	100	2,000	80	1,600
	40,000		40,000		38,000		37,400

(ii) Statement of Cost

Details	*Cost at the beginning of process*	*Cost added*	*Total cost*	*Equivalent Units*	*Cost per unit*
	Rs.	*Rs.*	*Rs.*	*Rs.*	*Rs.*
Material	80,000	14,80,000	15,60,000		
Less: Value of normal loss			(20 × 2,000 = 40,000)	38,000	40
			15,20,000		
Labour	15,000	3,59,000	3,74,000	37,400	10
Overheads	45,000	10,77,000	11,22,000	37,400	30
					80

(iii) Statement of distribution of cost:

(a) Completed and transferred to process 'B' = 35,000 units @Rs. 80 = Rs. 28,00,000.

(b) Abnormal loss : 1,000 units:

Materials 1,000 units @ 40	= Rs. 40,000
Labour and Overheads 800 units @ 40	= Rs. 32,000
	Rs. 72,000

(c) Closing WIP : 2,000 units

Materials 2,000 units @ 40	= Rs. 80,000
Labour and Overheads 1,600 units @ 40	= Rs. 64,000
	Rs. 1,44,000

(iv) Process 'A' Account

Dr. *Cr.*

	Particulars	*Units*	*Amount*		*Particulars*	*Units*	*Amount*
To	Opening WIP	2,000	1,40,000*	By	Normal Loss	2,000	40,000
	Material introduced	38,000	14,80,000	By	Abnormal loss	1,000	72,000
	Direct labour		3,59,000	By	Process 'B' A/c transfer to next process	35,000	28,00,000
	Overheads		10,77,000				
		_____	_____	By	Closing WIP	2,000	1,44,000
		40,000	30,56,000			40,000	30,56,000

*Materials + Labour + Overheads = Rs. (80,000 + 15,000 + 45,000) = Rs.1,40,000.

Normal Loss Account

Dr. *Cr.*

To	Process 'A' A/c	2,000	40,000	By	By Cost Ledger Control A/c	2,000	40,000
		2,000	40,000			2,000	40,000

Abnormal Loss Account

Dr. *Cr.*

To	Process 'A' A/c	1,000	72,000	By	By Cost Ledger Control A/c	1,000	20,000
		____	_____	By	Costing Profit and Loss A/c	____	52,000
		1,000	72,000			1,000	72,000

Question 33

RST Limited processes product Z through two distinct process – Process I and Process II. On completion, it is transferred to finished stock. From the following information for the year 2006-07, prepare Process I, Process II and Finished Stock A/c:

Particulars	*Process I*	*Process II*
Raw materials used	*7,500 units*	*–*
Raw materials cost per unit	*Rs. 60*	*–*
Transfer to next process/finished stock	*7,050 units*	*6,525 units*
Normal loss (on inputs)	*5%*	*10%*
Direct wages	*Rs. 1,35,750*	*Rs. 1,29,250*

Direct expenses	*60% of direct wages*	*65% of direct wages*
Manufacturing overheads	*20% of direct wages*	*15% of direct wages*
Realisable value of scrap per unit	*Rs. 12.50*	*Rs. 37.50*

6,000 units of finished goods were sold at a profit of 15% on cost. Assume that there was no opening or closing stock of work-in-progress.

(November 2007, 10 Marks)

Answer

Process I Account

		Qty.	Rate	Amount			Qty.	Rate	Amount
To	Raw material	7,500	60	4,50,000	By	Normal Loss (5% × 7,500)	375	12.50	4,688
To	Direct wages			1,35,750	By	Abnormal Loss	75	96.79	7,260
To	Direct expenses 60% of direct wages			81,450	By	Process II Account	7,050	96.79	6,82,402
To	Manufacturing Overheads (20% of direct wages)			27,150					
		7,500		6,94,350			7,500		6,94,350

Planned output – Process I = 7,500 – 375 = 7,125 units

Actual output = 7,050 units

Abnormal loss = (7,125 units – 7,050 units) 75 units.

$$\text{Cost per unit} = \frac{6,94,350 - 4,688}{7,125} = \text{Rs. } 96.7947. \quad (96.80 \text{ approx.})$$

Process II Account

		Qty.	Rate	Amount			Qty.	Rate	Amount
To	Process I	7,050	96.79	6,82,402	By	Normal Loss	705	37.50	26,438

							(10%)			
To	Direct wages			1,29,250	By	Finished Stock A/c	6,525	140.05	9,13,823
To	Direct expenses 65% of direct wages			84,013					
To	Manufacturing Overheads (15% of direct wages)			19,387					
				9,15,052					
To	Abnormal gain	180	140.05	25,209					
		7,230		9,40,261			7,230		9,40,261

Planned output of Process II = 7,050 – 705 = 6,345 units

$$\text{Cost per unit} = \frac{9,15,052 - 26,438}{6,345} = \text{Rs. } 140.05.$$

Abnormal gain = Actual output – Planned output
= 6,525 – 6,345
= 180 units.

Finished Stock Account

		Qty.	*Rate*	*Amount*			*Qty.*	*Rate*	*Amount*
To	Process II	6,525	140.05	9,13,823	By	Sales A/c	6,000	161.06	9,66,341
To	Profit and Loss Account				By	Balance c/d	525	140.05	73,526
				1,26,044					
		6,525		10,39,867			6,525		10,39,867

Question 34

A product passes through three processes 'X', 'Y' and 'Z'. The output of process 'X' and 'Y' is transferred to next process at cost plus 20 per cent each on transfer price and the output of process 'Z' is transferred to finished stock at a profit of 25 per cent on transfer price. The following informations are available in respect of the year ending 31st March, 2008:

	Process X	*Process Y*	*Process Z*	*Finished Stock*
	Rs.	*Rs.*	*Rs.*	*Rs.*
Opening stock	*15,000*	*27,000*	*40,000*	*45,000*

Material	*80,000*	*65,000*	*50,000*	
Wages	*1,25,000*	*1,08,000*	*92,000*	
Manufacturing Overheads	*96,000*	*72,000*	*66,500*	
Closing stock	*20,000*	*32,000*	*39,000*	*50,000*
Inter process profit included in				
Opening stock	*NIL*	*4,000*	*10,000*	*20,000*

Stock in processes is valued at prime cost. The finished stock is valued at the price at which it is received from process 'Z'. Sales of the finished stock during the period was Rs. 14,00,000.

You are required to prepare:

(i) Process accounts and finished stock account showing profit element at each stage.

(ii) Profit and Loss account.

(iii) Show the relevant items in the Balance Sheet.

(November 2008, 12 Marks)

Answer

(i) Process 'X' Account

Dr.

Particulars	Cost	Profit	Total	Particulars	Cost	Profit	Total
	Rs.	*Rs.*	*Rs.*		*Rs.*	*Rs.*	*Rs.*
To Opening Stock	15,000	–	15,000	By Process 'Y' A/c (Transfer)	2,96,000	74,000	3,70,000
To Material	80,000	–	80,000				
To Wages	1,25,000	–	1,25,000				
Total	2,20,000	–	2,20,000				
Less: Closing stock	20,000	–	20,000				
Prime Cost	2,00,000		2,00,000				
To Manufacturing Overheads	96,000	–	96,000				
Total cost	2,96,000	–	2,96,000				
To Profit and Loss A/c (20% on transfer Price							

	Or 25% on cost)		74,000	74,000				
		2,96,000	74,000	3,70,000		2,96,000	74,000	3,70,000

Process 'Y' Account

Dr. Cr.

	Particulars	Cost	Profit	Total		Particulars	Cost	Profit	Total
		Rs.	*Rs.*	*Rs.*			*Rs.*	*Rs.*	*Rs.*
To	Opening Stock	23,000	4,000	27,000	By	Process 'Z' A/c (Transfer)	5,36,379	2,26,121	7,62,500
To	Process 'X' A/c	2,96,000	74,000	3,70,000					
To	Material	65,000	–	65,000					
To	Wages	1,08,000	–	1,08,000					
Total		4,92,000	78,000	5,70,000					
Less: Closing stock		27,621	4,379	32,000					
Prime Cost		4,64,379	73,621	5,38,000					
To	Manufacturing Overheads	72,000	–	72,000					
Total cost		5,36,379	73,621	6,10,000					
To	Profit and Loss A/c (20% on transfer Price or 25% on cost)	–	1,52,500	1,52,500					
		5,36,379	2,26,121	7,62,500			5,36,379	2,26,121	7,62,500

Process 'Z' Account

Dr. Cr.

	Particulars	Cost	Profit	Total		Particulars	Cost	Profit	Total
		Rs.	*Rs.*	*Rs.*			*Rs.*	*Rs.*	*Rs.*
To	Opening Stock	30,000	10,000	40,000	By	Finished Stock A/c (Transfer)	7,45,629	5,50,371	12,96,000
To	Process 'Y' A/c	5,36,379	2,26,121	7,62,500					
To	Material	50,000	–	50,000					
To	Wages	92,000	–	92,000					
Total		7,08,379	2,36,121	9,44,500					

Less: Closing stock	29,250	9,750	39,000	
Prime Cost	6,79,129	2,26,371	9,05,500	
To Manufacturing Overheads	66,500	–	66,500	
Total cost	7,45,629	2,26,371	9,72,000	
To Profit and Loss A/c (25% on transfer Price or 33 1/3% on cost)	–	3,24,000	3,24,000	
	7,45,629	5,50,371	12,96,000	

Finished Stock Account

Dr. Cr.

Particulars	Cost	Profit	Total		Particulars	Cost	Profit	Total
	Rs.	*Rs.*	*Rs.*			*Rs.*	*Rs.*	*Rs.*
To Opening Stock	25,000	20,000	45,000	By	Finished Stock A/c (Transfer)	7,41,862	6,58,138	14,00,000
To Process 'Z' A/c	7,45,629	5,50,371	12,96,000					
Total	7,70,629	5,70,371	13,41,000					
Less: Closing stock	28,767	21,233	50,000					
To Profit and Loss A/c	7,41,862	5,49,138	12,91,000					
		1,09,000	1,09,000					
	7,41,862	6,58,138	14,00,000			7,41,862	6,58,138	14,00,000

(ii) Profit and Loss Account for the year ending 31st March, 2008

Dr.

Particulars	Amount		Particulars	Amount
	Rs.			Rs.
To *Provision for unrealized profit on closing stock*	35,362	By	Provision for unrealized profit on opening stock (Rs. 4,000 + 10,000 +	34,000

	(Rs. 4,379 + 9,750 + 21,233)			20,000)	
To	Net Profit	6,58,138	By	Process X A/c	74,000
			By	Process Y A/c	1,52,500
			By	Process Z A/c	3,24,000
		_____	By	Finished Stock A/c	1,09,000
		6,93,500			6,93,500

Workings:

Calculation of amount of unrealized profit on closing stock:

Process 'X' = Nil

$$\text{Process 'Y'} = \frac{\text{Rs. 78,000}}{\text{Rs. 5,70,000}} \times \text{Rs. 32,000} = \text{Rs. 4,379.}$$

$$\text{Process 'Z'} = \frac{\text{Rs. 2,36,121}}{\text{Rs. 9,44,500}} \times \text{Rs. 39,000} = \text{Rs. 9,750.}$$

$$\text{Finished stock} = \frac{\text{Rs. 5,50,371}}{\text{Rs. 12,96,000}} \times \text{Rs. 50,000} = \text{Rs. 21,233.}$$

(iii) Balance Sheet as on 31st March, 2008 (Extract)

Liabilities	Amount	Assets	Amount	Amount
	Rs.		*Rs.*	*Rs.*
Net profit	6,58,138	Closing stock		
		Process – X	20,000	
		Process – Y	32,000	
		Process – Z	39,000	
		Finished stock	50,000	
			1,41,000	
		Less: Provision for unrealized profit	35,362	1,05,638

11
Joint Products & By Products

Question 1

How would you account for by-product in cost accounting:

(i) When they are of small total value. *(2 marks)*

(ii) When they are of considerable total value. *(4 marks)*

(iii) When they require further processing. *(May, 1997, 4 marks)*

Answer

Treatment of By-product in Cost Accounting:

(i) *When they are of small total value:* If the amount realised from the sale of by-product is small, it may be dealt in any one of the following two ways:

(1) The sale value of the by-product may be credited to the Profit and Loss Account and no credit be given in the cost accounts. The credit to the Profit and Loss Account here is treated either as miscellaneous income or as additional sales revenue.

(2) The sale proceeds of the by-product may be treated as deductions from the total costs. The sale proceeds in fact should be deducted either from the production cost or from the cost of sales.

(ii) *When they are of considerable total value:* In this case by-products may be regarded as joint products. To determine exact cost of by-products the costs incurred upto the point of separation, should be apportioned over by-products and joint products by using a logical basis. In this case, the joint costs may be divided over joint products and by-products by using physical unit method (at the point of split off) or ultimate selling price (if sold).

(iii) *When they require further processing:* In this case, the net realisable value of the by-product at the split-off point may be arrived at by subtracting the further processing cost from the realisable value of by-products.

Question 2

Distinguish between Joint Product and By Product

Answer

Joint-product and By-product: Joint products and by-products arise from many industrial processes wherein, from a set of common inputs, two or more products of varying importance are obtained. For example, when hydrogenated oil is processed, along with oil, oxygen gas is

also produced molasses is produced along with sugar automatically. Some of the products are not of much importance from the sales-value point of view, like molasses in the case of sugar, but in some cases the products are all of importance. Usually, the term by-product is used in the former case and joint products in the other case. One can see that distinction between joint products and by-products turns on their relative importance which sometimes makes it difficult to make a distinction. However, one point to keep note of it is that, usually, in the case of joint products further processing is required, after initial common process, before the products are sold.

Thus joint products 'represent two or more products separated in the course of the same processing operations, usually requiring further processing, each product being in such proportion that no single product can be designated as a major product.'

By-products may be defined as any saleable or usual value incidentally produced in addition to the product.' Sometimes the word wastage or even loss is used to denote what is really a by-product. For example, in a thermal power plant, ash will remain when coal is used up. In a place where good deal of construction activity is going on, the ash will have a market-it is a case of by-product even if it is termed as wastage.

Question 3

In the course of manufacture of the main product 'P', by products 'A' and 'B' also emerge. The joint expenses of manufacture amount to Rs. 1,19, 550. All the three products are processed further after separation and sold as per details given below:

		Main products	*By-products*	
		'P'	*'A'*	*'B'*
Sales	*Rs.*	*90,000*	*60,000*	*40,000*
Costs incurred after separation	*Rs.*	*6,000*	*5,000*	*4,000*
Profit as percentage on sales	*%*	*25*	*20*	*15*

Total fixed selling expenses are 10% of total cost of sales which are apportioned to the three products in the ratio of 20 : 40 : 40.

(i) Prepare a statement showing the apportionment of joint costs to the main product and the two-by-products.

(ii) If the by-product 'A' is not subjected to further processing and is sold at the point of separation for which there is a market, at Rs. 58,500 without incurring and selling expenses, would you advise its disposal at this stage? Show the workings.

Answer

(i) Statement Showing Apportionment of Joint Costs to Main Product and two By-Products

	Main Product	*By-products*		*Total*
		A	*B*	
	Rs.	*Rs.*	*Rs.*	
Sales	90,000	60,000	40,000	1,90,000
Less: Profit	22,500	12,000	6,000	40,500
Cost of sales	67,500	48,000	34,000	1,49,500
Less: Selling expenses	2,990	5,980	5,980	14,950
Cost of production	64,510	42,020	28,020	1,34,550
Less: Costs after separation	6,000	5,000	4,000	15,000
Value at the stage of separation	58,510	37,020	24,020	1,19,550

Working note:

Total Cost of sales Rs. 1,49,500

Selling expenses are 10% of

Rs. 1,49,500 i.e. Rs. 14,950

(ii) Economics of By-product A

	Sales at split Off stage	*Sales after further processing*
	Rs.	*Rs.*
Sales	58,500	60,000
Costs	37,020	42,020
Profit	21,480	17,980

Since the profit earned is more if the by product is not processed further, it is advisable to sell the same before processing.

Working note:

Selling expense has not been taken into consideration, as without that the choice is apparent.

Question 4

In an Oil Mill four products emerge from a refining process. The total cost of input during the quarter ending March, 1983 in Rs. 1,48,000. The output, sales and additional processing costs are as under:

Product	*Output In Litres*	*Additional Processing Costs after Split off point*	*Sales value*
	Rs.	*Rs.*	*Rs.*
AOXE	*8,000*	*43,000*	*1,72,500*
BOXE	*4,000*	*9,000*	*15,000*
COXE	*2,000*	*–*	*6,000*
DOXE	*4,000*	*1,500*	*45,000*

In case these products were disposed of at the split off point that is before further processing the selling price would have been:

AOXE	*BOXE*	*COXE*	*DOXE*
Rs. 15.00	*Rs.6.00*	*Rs. 3.00*	*Rs. 7.50*

Prepare a statement of profitability based on:

(1) If the products are sold after further processing is carried out in the mills.

(2) If they are sold at the split off point.

Answer

(1) Statement of Profitability of an Oil Mill

(after Carrying out further processing)

(for the quarter ending March 1983)

Product's name	*Sales Value after further processing*	*Share of joint cost*	*Further processing cost*	*Total cost after split off*	*Profit (Loss)*
(a)	*(b)*	*(c)*	*(d)*	*(e) = (c) + (d)*	*(f = (b) – (c)*
	Rs.	*Rs.*	*Rs.*	*Rs.*	*Rs.*
AOXE	1,72,500	98,667	43,000	1,41,667	30,833
BOXE	15,000	19,733	9,000	28,733	(13,733)
COXE	6,000	4,933	-	4,933	1,067
DOXE	45,000	24,667	1,500	26,167	18,833
Total	2,38,500	1,48,000	53,500	2,02,500	37,000

Working Notes

1. Sales Value at split off point for:

   AOXE = 8,000 x Rs. 16 = 1,20,000

   BOXE = 4 ,000 x Rs. 6 = 24,000

COXE = 2,000 x Rs. 3 = 6,000

DOXE = 4,000 x Rs. 7.50 = 30,000

The ratio between the sale values of AOXE : BOXE : COXE : DOXE : 20 : 4 : 1 : 5.

2. Share of joint cost of AOXE, BOXE, COXE and DOXE has been determined by dividing the total joint cost viz Rs. 1,48,000 in the ratio 20 : 4 : 1 : 5

AOXE = Rs. $\frac{1,48,000}{30}$ x 20 = Rs. 98,667

BOXE = Rs. $\frac{1,48,000}{30}$ x 4 = Rs. 19,733

COXE = Rs. $\frac{1,48,000}{30}$ x 1 = Rs. 4,933

DOXE = Rs. $\frac{1,48,000}{30}$ x 5 = Rs. 24,657

(2) **Statement of Profitability of an Oil Mill**

(At the split off point)

(for the quarter ending March 1983)

Product's name	*Selling price at split off point*	*Output In units*	*Sales value at split off point*	*Share of joint cost*	*Profit at split off point*
(0)	*(1)*	*(2)*	*(3) = (1) x (2)*	*(4)*	*(5) = (3) – (4)*
	Rs.	*Rs.*	*Rs.*	*Rs.*	*Rs.*
AOXE	15	8,000	1,20,000	98,667	21,333
BOXE	6	4,000	24,000	19,733	4,267
COXE	3	2,000	6,000	4,933	1,067
DOXE	7.50	4,000	30,000	24,667	5,333
	Total		1,80,000	1,48,000	32,000

Note : For share of joint cost refer to working notes of part (1)

Question 5

Pokemon Chocolates manufactures and distributes chocolate products. It purchases Cocoa beans and processes them into two intermediate products:

- *Chocolate powder liquor base*
- *Milk-chocolate liquor base*

These two intermediate products become separately identifiable at a single split off point. Every 500 pounds of cocoa beans yields 20 gallons of chocolate – powder liquor base and 30 gallons of milk-chocolate liquor base.

The chocolate powder liquor base is further processed into chocolate powder. Every 20 gallons of chocolate-powder liquor base yields 200 pounds of chocolate powder. The milk-chocolate liquor base is further processed into milk-chocolate. Every 30 gallons of milk-chocolate liquor base yields 340 pounds of milk chocolate.

Production and sales data for October, 2004 are:

** Cocoa beans processed*	*7,500 pounds*
• *Costs of processing Cocoa beans to split off point (including purchase of beans)*	*Rs. 7,12,500*

	Production	*Sales*	*Selling price*
Chocolate powder	*3,000 pounds*	*3,000 pounds*	*Rs. 190 per pound*
Milk chocolate	*5,100*	*5,100*	*Rs. 237.50 per pound*

The October, 2004 separable costs of processing chocolate-powder liquor into chocolate powder are Rs. 3,02,812.50. The October 2004 separable costs of processing milk-chocolate liquor base into milk-chocolate are Rs. 6,23,437.50.

Pokemon full processes both of its intermediate products into chocolate powder or milk-chocolate. There is an active market for these intermediate products. In October, 2004, Pokemon could have sold the chocolate powder liquor base for Rs. 997.50 a gallon and the milk-chocolate liquor base for Rs. 1,235 a gallon.

Required:

(i) Calculate how the joint cost of Rs. 7,12,500 would be allocated between the chocolate powder and milk-chocolate liquor bases under the following methods:

(a) Sales value at split off point

(b) Physical measure (gallons)

(c) Estimated net realisable value, (NRV) and

(d) Constant gross-margin percentage NRV.

(ii) What is the gross-margin percentage of the chocolate powder and milk-chocolate liquor bases under each of the methods in requirements (i) ?

(iii) Could Pokemon have increased its operating income by a change in its decision to fully process both of its intermediate products? Show your computations.

(Nov, 2004, 8 + 2 + 3 = 13 marks)

Answer

(i) Comparison of alternative joint-cost allocation methods

Sales value at split-off point method

	Chocolate powder liquor base	*Milk chocolate liquor base*	*Total*
Sales value of products at split off	Rs. 2,99,250	Rs. 5,55,750	Rs. 8,55,000
Weights	0.35	0.65	1.00
Joint cost allocated	Rs. 7,12,500 x 0.35 = Rs. 2,49,375	Rs. 7,12,,500 x 0.65 = Rs. 4,63,125	

- 300 x 997.50 = Rs. 2,99,250
- 450 x 1235 = Rs. 5,55,750

Physical measure method

	Chocolate powder liquor base	*Milk chocolate liquor base*	*Total*
Output	300 gallons	450 gallons	750 gallons
Weight	300/750 = 0.40	450/750 = 0.60	1.00
Joint cost allocated	Rs. 7,12,500 x 0.40 =Rs. 2,85,000	Rs. 7,12,500 x 0.60 = Rs. 4.27, 500	Rs. 7,12,500

Net realisable value method

	Chocolate powder liquor base	*Milk chocolate liquor base*	*Total*
Final sales value of production	3,000 lbs x Rs. 190 = Rs. 5,70,000	5.100 lbs x Rs. 237.50 = Rs.12,11,250	Rs. 17,81,250
Less: separable costs	Rs. 3,02,812.50	Rs. 6,23,437.50	Rs. 9,26,250
Net realisable value at split off point	Rs. 2,67,187,50	Rs. 5,87,812.50	Rs. 8,55,000
Weight	2,67,187.50/8,55.000 = 0.3125	5,87,812.5/8,55,000 = 0.6875	
Joint cost allocated	Rs. 7,12,500 x 0.3125 = Rs. 2,22,656.25	Rs. 7,12,500 x 0.6875 = Rs. 4,89,843.75	Rs. 7,12,500

Constant + gross margin % NRV method

	Chocolate powder Liquor base	*Milk chocolate liquor base*	*Total*
Final sales value of production	Rs. 5,70,000	Rs. 12,11,250	Rs. 17,81,250
	(Chocolate Powder)	*(Milk Chocolate)*	
**Less:* Gross margin 8%	Rs. 45,600	Rs. 96,900	Rs 1,42,500
Cost of goods available for sale	Rs. 5,24,400	Rs. 11,14,350	Rs. 16,38,750
Less Separable costs	Rs. 3,02,812.50	Rs. 6,23,437.50	Rs. 9,26,250
Joint cost allocated	Rs. 2,21,587.50	Rs. 4,90,912.50	Rs. 7,12,500

*Final sales value of total production	= Rs. 17,81,250
Deduct joint and separable cost	= Rs. 712500 + Rs. 926250
	= Rs. 16,38,750
Gross Margin	= Rs. 1,42,500
Gross margin %	= Rs 1,42,500 / Rs.17,81,250 = 8%

(ii) Chocolate powder liquor base (calculations in Rs)

	Sales value at Split off	*Physical Measure*	*Estimated net Realisable Value*	*Constant gross Margin NRV*
Final sale value of Chocolate powder	5,70,000	5,70,000	5,70,000	5,70,000
Less: separable costs	3,02,812.50	3,02,812.50	3,02,812.50	3,02,812.50
Less: Joint costs	2,49,375	2,85,000	2,22,656.25	2,21,587.50
Gross Margin	17,812.50	(17,812.50)	44,531.25	45,600
Gross Margin %	3.125%	(3.125%)	7.8125%	8%

Milk chocolate liquor base (calculations in Rs.)

	Sales value at split off	*Physical measure*	*Estimated net realisable*	*Constant Gross margin NRV*
Final sale value of milk chocolate	12,11,250	12,11,250	12,11,250	12,11,250
Less: separable costs	6,23,437.50	6,23,437.50	6,23,437.50	6,23,437.50
Less: Joint costs	4,63,125	4,27,500	4,89,843.75	4,90,912

Gross Margin	1,24,687.50	1,60,312.50	97,968.75	96,900.50
Gross Margin %	10.29%	13.23%	8.08%	8%

(iii) Further processing of Chocolate powder liquor base into Chocolate powder (calculations in Rs)

Incremental revenue (5,70,000 – (997.50 x 300)	2,70,750
Incremental costs	3,02,812.50
Incremental operating income	(32,062.50)
Further processing of Milk chocolate liquor base into milk chocolate (calculations in Rs)	
Incremental revenue ((12,11,250 – 5,55,750)	6,55,500
Incremental cost	6,23,437.50
Incremental operating income	32,062.50

The above computations show that Pokemon Chocolates could increase operating income by Rs 32,062.50 if chocolate liquor base is sold at split off point and milk chocolate liquor base is processed further.

Question 6

A company processes a raw material in its Department 1 to produce three products, viz. B and X at the same split-off stage. During a period 1,80,000 kgs of raw materials were processed in Department 1 at a total cost of Rs. 12,88,000 and the resultant output of A, B and X were 18,000 kgs, 10,000 kgs and 54,000 kgs respectively. A and B were further processed in Department 2 at a cost of Rs. 1,80,000 and Rs. 1,50,000 respectively.

X was further processed in Department 3 at a cost of Rs 1,08,000. There is no waste in further processing. The details of sales effected during the period were as under:

		A	*B*	*X*
Quantity Sold	*(kgs.)*	*17,000*	*5,000*	*44,000*
Sales Value	*(Rs.)*	*12,24,000*	*2,50,000*	*7,92,000*

There were no opening stocks. If these products were sold at split-off stage, the selling prices of A, B and X would have been Rs. 50, Rs. 40 and Rs. 10 per kg respectively. Required:

(i) Prepare a statement showing the apportionment of joint costs to A, B and X.

(ii) Present a statement showing the cost per kg of each product indicating joint cost and further processing cost and total cost separately.

(iii) Prepare a statement showing the productwise and total profit for the period.

(iv) State with supporting calculations as to whether any or all the products should be further processed or not (Nov, 1996, 12 marks)

Answer

(i) Statement showing the apportionment of joint costs to A, B and X

Products	*A*	*B*	*X*	*Total*
Output (kg)	18,000	10,000	54,000	
Sales value at the point of split off (Rs.)	9,00,000 (Rs. 50 x 18,000)	4,00,000 (Rs. 40x10,000)	5,40,000 (Rs. 10 x 54,000)	18,40,000
Joint cost apportionment on the basis of sales value at the point of split off (Rs.)	6,30,000 $\left(\frac{Rs12,88,000}{Rs18,40,000} x Rs9,00,000\right)$	2,80,000 $\left(\frac{Rs12,88,000}{Rs18,40,000} x Rs4,00,000\right)$	3,78,000 $\left(\frac{Rs12,88,000}{Rs18,40,000} x Rs5,40,000\right)$	12,88,000

(ii) Statement showing the cost per kg. Of each product (indicating joint cost; further processing cost and total cost separately)

Products	*A*	*B*	*X*
Joint costs apportioned (Rs.) : (I) *[Refer to a(i)]*	6,30,000	2,80,000	3,78,000
Production (kg) : (II)	18,000	10,000	54,000
Joint cost per kg (Rs.): (I/II)	35	28	7
Further processing	10	15	2
Cost per kg. (Rs)	$\left(\frac{Rs.1,80,000}{18,000 kg}\right)$	$\left(\frac{Rs.1,50,000}{10,000 kg}\right)$	$\left(\frac{Rs.1,08,000}{54,000 kg}\right)$
Total cost per kg (Rs.)	45	43	9

(iii) Statement showing the productwise and total profit for the period

Products	*A*	*B*	*X*	*Total*
Sales value (Rs.)	12,24,000	2,50,000	7,92,000	
Add: Closing stock value (Rs.) *(Refer to Working note 2)*	45,000	2,15,000	90,000	
(I) Value of production (Rs.)	12,69,000	4,65,000	8,82,000	26,16,000
Apportionment of joint cost (Rs.) *[Refer to a(i)]*	6,30,000	2,80,000	3,78,000	
Add: Further processing cost (Rs.)	1,80,000	1,50,000	1,08,000	

(II) Total cost (Rs.)	8,10,000	4,30,000	4,86,000	17,26,000
Profit (Rs.) : (I – II)	4,59,000	35,000	3,96,000	8,90,000

Working Notes

1.

Products	*A*	*B*	*X*	*Total*
Sales value (Rs.)	12,24,000	2,50,000	7,92,000	
Quantity sold (Kgs.)	17,000	5,000	44,000	
Selling price Rs./kg	72	50	18	
	$\left(\frac{\text{Rs.12,24,000}}{17{,}000\,\text{kg}}\right)$	$\left(\frac{\text{Rs.2,50,000}}{5{,}000\,\text{kg}}\right)$	$\left(\frac{\text{Rs.7,92,000}}{44{,}000\,\text{kg}}\right)$	

2. Valuation of closing stock:

Since the selling price per kg of products A, B and X is more than their total costs, therefore closing stock will be valued at cost.

Products	*A*	*B*	*X*	*Total*
Closing stock (kgs.)	1,000	5,000	10,000	
Cost per kg (Rs.)	45	43	9	
Closing stock value (Rs.)	45,000	2,15,000	90,000	3,50,000
	(Rs. 45 x 1,000 kg)	*(Rs. 43 x 5,000 kg)*	*(Rs. 9 x 10,000 kg)*	

(iv) Calculations for processing decision

Products	*A*	*B*	*X*
Selling price per kg at the point of split off (Rs.)	50	40	10
Selling price per kg after further processing (Rs.) *(Refer to working Note I)*	72	50	18
Incremental selling price per kg (Rs.)	22	10	8
Less: Further processing cost per kg (Rs.)	10	15	2
Incremental profit (loss) per kg (Rs)	12	(- 5)	6

Since product B does not give any profit on further processing; it should not be further processed.

Question 7

Inorganic Chemical purchases salt and processes it into more-refined products such as caustic soda, chlorine, and PVC (Polyvinyl chloride). During the month of April, 2000, Inorganic Chemicals purchased salt for Rs. 10,00,000. Conversion cost of Rs. 15,00,000 were incurred upto the split-off point, at which time two saleable products wee produced: Caustic

soda and chlorine. Chlorine can be further processed into PVC. The April production and sales information are as follows:

	Production	*Sales*	*Sales Price per Ton*
Caustic Soda	*1,200 tons*	*1,200 tons*	*Rs. 1,250*
Chlorine	*800 tons*		
PVC	*500 tons*	*500 tons*	*Rs. 5,000*

All 800 tons of chlorine were further processed, at an incremental cost of Rs. 5,00,000 to yield 500 tons of PVC. There were no byproducts or scrap from this further processing of chlorine. There were no beginning or ending inventories of caustic soda, chlorine or PVC in April.

There is an active market for chlorine. Inorganic Chemicals could have sold all its April production of chlorine at Rs. 1,875 a ton.

Required:

(i) Calculate, how the joint costs of Rs. 25,00,000 would be allocated between Caustic soda and Chlorine under each of the following methods:

(1) sales value at split off;

(2) physical measure (tone); and

(3) estimated net realizable value.

(ii) What is the gross margin percentage of Caustic soda and PVC under the three methods cited in requirement (i)?

(iii) Lifetime Swimming Pool Products offer to purchase 800 tons of Chlorine in May, 2000 at Rs. 1,875 a ton. This sale would mean that no PVC would be produced in May. How would accepting the offer affect May Operating Income? (May, 2000, 12 marks)

Answer

(i) (1) Statement of Joint Costs allocation between Caustic soda and Chlorine by using sales value method at split off

Products	*Caustic soda*	*Chlorine*	*Total*
Sales value at split off (Rs.)	15,00,000	15,00,000	30,00,000
	(1,200 tons x Rs. 1,250)	*(800 tons x Rs. 1,875)*	
Weightage	0.5	0.5	
Joint costs allocated (Rs.)	12,50,000	12,50,000	25,00,000
	(Rs. 25,00,000 x 0.5)	*(Rs. 25,00,000 x 0.5)*	

(2) Statement of Joint Costs allocation between Caustic soda and Chlorine by using physical measure (tons) method

Products	*Caustic soda*	*Chlorine*	*Total*
Physical measure (tons)	1,200	800	2,000
Weightage	0.6	0.4	
Joint costs allocated (Rs.)	15,00,000 *(Rs. 25,00,000 x 0.6)*	10,000,000 *(Rs. 25,00,000 x 0.4)*	25,00,000

(3) Statement of Joint Costs allocation between Caustic soda and Chlorine by using estimated net realizable value method

Products	*Caustic soda*	*Chlorine*	*Total*
Expected sales value of production (Rs.)	15,00,000 *(1,200 tons x Rs. 1,250)*	25,00,000 *(500 tons x Rs. 5,000)*	40,00,000
Less: Further processing cost (Rs.)	--	5,00,000	5,00,000
Estimated net realisable value a spit off point (Rs.)	15,00,000	20,00,000	35,00,000
Weightage	3/7	4/7	
Joint cost allocated (Rs.)	10,71,429 $\left(\frac{3}{7} \text{ x Rs. } 25,00,000\right)$	14,28,571 $\left(\frac{4}{7} \text{ x Rs. } 25,00,000\right)$	25,00,000

(ii) Statement of gross margin percentage of Caustic soda and PVC under sales value, physical measure and estimated net realizable value methods

	Sales value (at split off)	*Physical Measure*	*Estimated net realizable value*
Caustic soda:			
Sales (Rs.)	15,00,000	15,00,000	15,00,000
Less: Joint costs allocated (Rs.)	12,50,000	15,00,000	10,71,429
Gross margin (Rs.)	2,50,000	0	4,28,571
Gross margin (in %)	16.67 $\left(\frac{\text{Rs.}2,50,000}{\text{Rs.}15,00,000} \text{x} 100\right)$	0	28.57 $\left(\frac{\text{Rs.}4,28,571}{\text{Rs.}15,00,000} \text{x} 100\right)$
PVC:			
Sales (Rs.) *(500 tons x Rs.5,000)*	25,00,000	25,00,000	25,00,000

Less: Joint cost allocated (Rs.)	12,50,000	10,00,000	14,28,571
Less: Further processing cost (Rs.)	5,00,000	5,00,000	5,00,000
Gross margin (Rs.)	7,50,000	10,00,000	5,71,429
Gross margin (in %)	30	40	22.86
	$\left(\frac{Rs.7,50,000}{Rs.25,00,000} x100\right)$	$\left(\frac{Rs.10,00,000}{Rs.25,00,000} x100\right)$	$\left(\frac{Rs.5,71,429}{Rs.25,00,000} x100\right)$

(iii) Incremental revenue from further processing of Chlorine into PVC

500 tons x Rs. 5,000 – 800 tons x Rs. 1,875: (A)	Rs. 10,00,000
Incremental costs of further processing of chlorine into PVC (B)	Rs. 5,00,000
Incremental operating income from further processing: {(A) – (B)}	Rs. 5,00,000

Decision: The operating income of Inorganic Chemicals which converts chlorine into PVC after further processing will be reduced by Rs. 5,00,000 in May, if it accepts the offer of Lifetime Swimming Pool Products, of selling to them 800 tons of Chlorine at Rs. 1875 per ton.

Question 8

Two products P and Q are obtained in a crude form and require further processing at a cost of Rs. 5 for P and Rs. 4 for Q per unit before sale. Assuming a net margin of 25 percent on cost, their sale prices are fixed at Rs. 13,75 and Rs. 8.75 per unit respectively. During the period, the joint cost was Rs. 88,000 and the outputs were:

P 8,000 units

Q 6,000 units

Ascertain the joint cost per unit *(May, 1998, 15 marks)*

Answer

Statement for ascertaining joint cost per unit

Output (units)	*8,000*	*6,000*
Products	*P*	*Q*
	Rs.	*Rs.*
Selling price (p.u)	13.75	8.75
Less: Margin @ 25% on cost or 20 % on sales	2.75	1.75
Cost of sales	11.00	7.00
Less: Post split off cost	5.00	4.00
Pre-split off net joint cost pre unit	6.00	3.00
Share in joint cost of units of Pand Q can be obtained by apportioning it in	64,000	24,000

the ratio of 8:3		
(Refer to working Note)		
Ascertained joint cost per unit	8.00	4.00
	(Rs. 64,000/8,000 units)	*(Rs. 24,000/6,000 units)*

Working Note:

Products	*P*	*Q*
Units	8,000	6,000
Total output cost (Rs.)	48,000	18,000
	(8,000 x Rs. 6)	(6,000 x Rs. 3)
Ratio between total output cost of two type of products:	8	3

Question 9

The Sunshine Oil Company purchases crude vegetable oil. It does refining of the same. The refining process results in four products at the split off point: M, N, O and P.

Product O is fully processed at the split off point. Product M, N and P can be individually further refined into 'Super M', 'Super N' and 'Super P'. In the most recent month (October, 1999), the output at split off point was:

Product M	*3,00,000 gallons*
Product N	*1,00,000 gallons*
Product O	*50,000 gallons*
Product P	*50,000 gallons*

The joint cost of purchasing the crude vegetable oil and processing it were Rs. 40,00,000.

Sunshine had no beginning or ending inventories. Sales of Product O in October were Rs. 20,00,000. Total output of products M, N and P was further refined and then sold. Data related to October, 1999 are as follows:

	Further Processing Costs to Make Super Products	*Sales*
Super M'	*Rs. 80,00,000*	*Rs. 1,20,00,000*
Super N'	*Rs. 32,00,000*	*Rs. 40,00,000*
Super P'	*Rs. 36,00,000*	*Rs. 48,00,000*

Sunshine had the option of selling products M, N and P at the split off point. This alternative would have yielded the following sales for the October, 1999 production:

Product M	*Rs. 20,00,000*
Product N	*Rs. 12,00,000*
Product P	*Rs. 28,00,000*

You are required to answer:

(i) *How the joint cost of Rs. 40,00,000 would be allocated between each product under each of the following methods (a) sales value at split off; (b) physical output (gallons); and (c) estimated net realizable value?*

(ii) *Could Sunshine have increased its October, 1999 operating profits by making different decisions about the further refining of product M, N or P? Show the effect of any change you recommend on operating profits.* *(Nov, 1999, 12 marks)*

Answer

(i) (a) Statement of joint cost allocated between each product by using sales value at split – off method

Products	*Sales value of the point of split off*	*Joint cost allocated*
	(Rs.)	*(Rs.)*
M	20,00,000	10,00,000 $\left(\frac{\text{Rs.40,000}}{\text{Rs.80,000}}\right)$ x Rs.20,00,000
N	12,00,000	6,00,000 $\left(\frac{\text{Rs.40,000}}{\text{Rs.80,000}}\right)$ x Rs.12,00,000
O	20,00,000	10,00,000 $\left(\frac{\text{Rs.40,000}}{\text{Rs.80,000}}\right)$ x Rs.20,00,000
P	28,00,000	14,00,000 $\left(\frac{\text{Rs.40,000}}{\text{Rs.80,000}}\right)$ x Rs.28,00,000
Total	80,00,000	40,00,000

(b) Statement of joint cost allocated between each product by using physical output (gallons) method

Products	*Physical output (in gallons)*	*Joint cost allocated (Rs.)*
M	3,00,000	24,00,000 $\left(\frac{\text{Rs.40,00,000}}{\text{5,00,000 gallons}}\right)$x.3,00,000

N	1,00,000	8,00,000 $\left(\frac{Rs.40,00,000}{5,00,000\ gallons}\right)$ x.1,00,000
O	50,000	4,00,000 $\left(\frac{Rs.40,00,000}{5,00,000\ gallons}\right)$ x.50,000
P	50,000	4,00,000 $\left(\frac{Rs.40,00,000}{5,00,000\ gallons}\right)$ x.50,000
Total	5,00,000	40,00,000

(c) Statement of joint cost allocated between each product by using estimated net realizable value method

Products	*Sales revenue after further processing*	*Sales revenue at the point of split off*	*Further processing costs*	*Net realizable value*	*Joint cost allocated*
	(Rs.)	*(Rs.)*	*(Rs.)*	*(Rs.)*	*(Rs.)*
(a)	(b)	(c)	(d)	(e)=[(b) – (d)] or (c)	
'Super M'	1,20,00,000		80,00,000	40,00,000	20,00,000 $\left(\frac{Rs.40,00,000}{Rs.80,00,000}\right)$ x Rs.40,00,000
'Super N'	40,00,000		32,00,000	8,00,000	4,00,000 $\left(\frac{Rs.40,00,000}{Rs.80,00,000}\right)$ x Rs.8,00,000
O	--	20,00,000	--	20,00,000	10,00,000 $\left(\frac{Rs.40,00,000}{Rs.80,00,000}\right)$ x Rs.20,00,000

'Super P'	48,00,000	36,00,000	12,00,000	6,00,000
				$\left(\frac{Rs.40,00,000}{Rs.80,00,000}\right)$ x Rs.12,00,000
	Total		80,00,000	40,00,000

(ii) Decision about the further refining of Product M, N or P.

Products	*M*	*N*	*P*
	Rs.	*Rs.*	*Rs.*
Sales revenue after further processing: (A)	1,20,00,000	40,00,000	48,00,000
Sales revenue at the point of split off: (B)	20,00,000	12,00,000	28,00,000
Incremental sales revenue: (C)={(A)-(B)}	1,00,00,000	28,00,000	20,00,000
Further processing cost: (D)	80,00,000	32,00,000	36,00,000
Profit (Loss) arising due to further processing: {(C) – (D)}	20,00,000	(4,00,000)	(16,00,000)

Decision

It is apparent from above that further processing of products N and P results in the decrease of the operating profit by Rs. 20,00,000. Hence M/s. Sunshine should not resort to further processing of its N and P products. This decision on adoption would increase the operating profits of the company for the month of October 1999 by Rs. 20,00,000.

Question 10

ABC Ltd. operates a simple chemical process to convert a single material into three separate items, referred to here as X, Y and Z. All three end products are separated simultaneously at a single split-off point.

Product X and Y are ready for sale immediately upon split off without further processing or any other additional costs. Product Z, however, is processed further before being sold. There is no available market price for Z at the split-off point.

The selling prices quoted here are expected to remain the same in the coming year. During 2002-03, the selling prices of the items and the total amounts sold were:

X – 186 tons sold for Rs. 1,500 per ton

Y – 527 tons sold for Rs. 1,125 per ton

Z – 736 tons sold for Rs. 750 per ton

The total joint manufacturing costs for the year were Rs. 6,25,000. An additional Rs. 3,10,000 was spent to finish product Z.

There were no opening inventories of X, Y or Z at the end of the year, the following inventories of complete units were on hand:

X 180 tons

Y 60 Tons

Z 25 tons

There was no opening or closing work-in-progress.

Required:

(i) Compute the cost of inventories of X, Y and Z for Balance Sheet purposes and cost of goods sold for income statement purpose as of March 31, 2003, using:

(a) Net realizable value (NRV) method of joint cost allocation

(b) Constant gross-margin percentage NRV method of joint-cost allocation.

(ii) Compare the gross-margin percentages for X, Y and Z using two methods given in requirement (i) (May, 2003, 4 + 4 + 2 = 10 marks)

Answer

(i) (a) Statement of Joint Cost allocation of inventories of X, Y and Z for Balance Sheet purposes

(By using net realisable value method)

	Products			
	X	*Y*	*Z*	*Total*
	Rs.	*Rs.*	*Rs.*	*Rs.*
Final sales value of total production *(Refer to working note 1)*	5,49,000 *(366 tons x Rs. 1,500)*	6,60,375 *(587 tons x Rs. 1,125)*	5,70,750 *(761 tons x Rs. 750)*	17,80,125
Less: Additional cost	--	--	*3,10,000*	3,10,000
Net realisable value *(at split-off point)*	5,49,000	6,60,375	2,60,750	14,70,125
Joint cost allocated *(Refer to working note 2)*	2,33,398	2,80,748	1,10,854	6,25,000

Cost of goods sold for income statement purpose as of March 31,2003

(By using net realisable value method)

	Products			
	X	*Y*	*Z*	*Total*
	Rs.	*Rs.*	*Rs.*	*Rs.*
Allocated joint cost	2,33,378	2,80,748	1,10,854	6,25,000
Additional costs	–	–	3,10,000	3,10,000
Cost of goods available for sale (CGAS)	2,33,398	2,80,748	4,20,854	9,35,000

Less: Cost of ending inventory X : 49.18% Y : 10.22% x (CGAS) Z : 3.29% *(Refer to working note)*	1,14,785	28,692	13,846	(1,57,323)
Cost of goods sold	1,18,613	2,52,056	4,07008	7,77,677

Income Statement

(Showing gross margin and gross margin percentage)

(By using net realisable value method)

	Products			
	X	*Y*	*Z*	*Total*
Sales revenue (Rs.)	2,79,000 *(186 tons x Rs. 1,500)*	5,92,875 *(527 tons x Rs. 1,125)*	5,52,000 *(736 tons x Rs. 750)*	14,23,875
Less: Cost of goods sold (Rs.)	1,18,613	2,52,056	4,07,008	7,77,677
Gross margin (Rs.)	1,60,387	3,40,819	1,44,992	6,46,198
Gross margin (%)	57.49%	57.49%	26.26%	

(b) Statement of joint cost allocation of inventories of X, Y and Z for Balance sheet purposes

(By using constant gross margin percentage net-realisable value method)

	Product			
	X	*Y*	*Z*	*Total*
	Rs.	*Rs.*	*Rs.*	*Rs*
Final sales value of total production	5,49,000	6,60,375	5,70,750	17,80,125
Less: Gross margin	2,60,641	3,13,517	2,70,967	8,45,125
(Refer to working note 3)	2,88,359	3,46,958	2,99,783	9,35,000
Less: Additional Cost	_____	_____	3,10,000	3,10,000
Joint cost allocated	2,88,359	3,46,858	(10,217)	6,25,000

Note: The negative joint cost allocation to product Z illustrates one 'unusual' feature of the constant gross margin NRV method.

Cost of goods sold for income statement purpose

(By using constant gross margin percentage net-realisable value method)

	Products			
	X	*Y*	*Z*	*Total*
Allocated joint cost	2,88,359	3,46,858	(10,217)	6,25,000
Joint Cost			3,10,000	3,10,000

Cost of goods available for sale (CGAS)	2,88,359	3,46,858	2,99,783	9,35,000
Less: Cost of ending inventory	1,41,815	35,449	9,863	1,87,127
X: 49.18% Y: 10.22% x CCGS Z: 3.29%				
Cost of goods sold	1,46,544	3,11,409	2,89,920	7,47,873

Income Statement

(Showing gross margin and gross margin percentage by using constant gross margin percentage NRV method)

	Product			
	X	*Y*	*Z*	*Total*
Sales revenue (Rs.)	2,79,000	5,92,875	5,52,000	14,23,875
Less: Cost of goods sold (Rs.)	1,46,544	3,11,409	2,89,920	7,47,873
Gross margin (Rs.)	1,32,456	2,81,466	2,62,080	6,76,002
Gross margin (%)	47.475%	47.475%	47.478%	47.478%

(ii) Comparative statement of gross percentage for X, Y and Z

(Using net realisable value and Constant gross margin percentage NRV methods)

Method	*Product gross margin percentage*		
	X	*Y*	*Z*
Net realisable	57.49	57.49	26.26
Constant gross margin percentage NRV	47.48	47.48	47.48

Working notes

1. **Total production of three products for the year 2002-2003:**

Items/Products	*Quantity sold in tones*	*Quantity of ending inentory in tons*	*Total producion*	*Ending inventory percentage*
(1)	*(2)*	*(3)*	*(4) = [(2) + (3)}*	*(5) = (3)/ (4)*
X	186	180	366	49.18
Y	527	60	587	10.22
Z	736	25	761	3.29

2. **Joint cost apportioned to each product:**

$$\frac{\text{Total joint cost}}{\text{Total net realisable value}} \times \text{Net realisable value of each product}$$

$$= \text{Total cost of product X} = \frac{\text{Rs.6,25,000}}{\text{Rs.14,70,125}} \text{ x Rs.5,49,000}$$

Similarly, the joint cost of inventories of products Y and Z comes to Rs. 2,80,748 and Rs 1,10,854 respectively.

3. Gross margin percentage

		Rs.
Final sales value production		17,80,125
Less: Joint cost and additional costs (Rs. 6,25,000 + Rs. 3,10,000)		9,35,000
Gross margin		8,45,125
Gross margin percentage	47.4756%	
(Rs. 8,45,125/Rs. 17,80,125) x 100		

Question 11

SUNMOON Ltd. produces 2,00,000; 30,000; 25,000; 20,000 and 75,000 units of its five products A, B, C and E respectively in a manufacturing process and sells them at Rs. 17, Rs. 13, Rs. 8, Rs 10 and Rs. 14 per unit. Except product D remaining products can be further processed and then can be sold at Rs. 25, Rs. 17, Rs. 12 and Rs. 20 per unit in case of A, B, C and E respectively.

Raw material costs Rs. 35,90,000 and other manufacturing expenses cost Rs. 5,47,000 in the manufacturing process which are absorbed on the products on the basis of their. 'Net realisable value'. The further processing costs of A, B, C and E are Rs, 12,50,000, Rs. 1,50,000; Rs. 50,000 and Rs. 1,50,000 respectively. Fixed costs are Rs. 4,73,000.

You are required to prepare the following in respect of the coming year.

(a) Statement showing income forecast of the company assuming that none of its products are to be further processed.

(b) Statement showing income forecast of the company assuming that products A, B, C and E are to be processed further.

Can you suggest any other production plan whereby the company can maximise its profits. If yes, then submit a statement showing income forecast arising out of adoption of that plan. (Nov, 1997, 16 marks)

Answer

Working Note:

Statement showing apportionment of joint costs on net realisable value basis

Products	*Sales Value*	*Post separation cost*	*Net reaisable Value*	*Apportioned joint costs*
	(1)	*(2)*	*(1) – (2) = (3)*	*(4)*
	Rs.	*Rs.*	*Rs.*	*Rs.*
A	50,00,000 (2,00,000 units x Rs. 25)	12,50,000	37,50,000	26,25,000
C	3,00,000 (25,000 units x Rs. 12)	50,000	2,50,000	1,75,000
D	2,00,000 (20,000 units x Rs. 10)	--	2,00,000	1,40,000
E	15,00,000 (75,000 units x Rs. 20)	1,50,000	13,50,000	9,45,000
			59,10,000	41,37,000

Total joint cost = Raw materials costs + Manufacturing expenses

= Rs. 35,90,000 + Rs. 5,47,000 = Rs. 41,37,000

Apportioned joint cost = $\frac{\text{Total joint cost}}{\text{Total net realisable value}} \times \frac{\text{Net realisable value}}{\text{of each product}}$

Apportioned joint cost for product A = $\frac{\text{Rs. } 41{,}37{,}000}{\text{Rs. } 59{,}10{,}000} \times \text{Rs. } 37{,}50{,}000 = \text{Rs. } 26{,}25{,}000$

Similarly, the apportioned joint cost for products B, C, D and E are Rs.2,52,000, Rs.1,75,000, Rs.1,40,000 and Rs.9,45,000 respectively

(a) Statement showing income forecast of the company assuming that none of its products are further processed Product

	A	*B*	*C*	*D*	*E*	*Total*
	Rs.	*Rs.*	*Rs.*	*Rs.*	*Rs.*	*Rs.*
Sales revenue	34,00,000 (2,00,000 units x Rs. 17)	3,90,000 30,000 units x Rs 13)	2,00,000 (25,000 units x Rs. 8)	2,00,000 (20,000 units x Rs. 10)	10,50,000 (75,000 units x Rs. 14)	52,40,000
Less: Apportioned joint cost *(Refer to working note)*	26,25,000	2,52,000	1,75,000	1,40,000	9,45,000	41,37,000

Excess of revenue over joint cost of manufacturing	7,75,000	1,38,000	25,000	60,000	1,05,000	11,03,000
Less: Fixed cost						4,73,000
Profit						6,30,000

(b) Statement showing income forecast of the company; assuming that products A, B, C and E are further processed

(Refer to working note)

	Products					
	A	*B*	*C*	*D*	*E*	*Total*
	Rs.	*Rs.*	*Rs.*	*Rs.*	*Rs.*	*Rs.*
Sales revenue: (X)	50,00,000	5,10,000	3,00,000	2,00,000	15,00,000	75,10,000
Apportioned joint cost: (Y)	26,25,000	2,52,000	1,75,000	1,40,000	9,45,000	41,37,000
Further processing cost: (Z)	12,50,000	1,50,000	50,000--	--	1,50,000	16,00,000
Total manufacturing cost (K)=(Y) + (Z)	38,75,000	4,02,000	2,25,000	1,40,000	10,95,000	57,37,000
Excess of sales revenue over total manufacturing Cost: [(X) – (K)]	11,25,000	1,08,000	75,000	60,000	4,05,000	17,73,000
Less: Fixed cost						4,73,000
Profit						13,00,000

Suggested production plan for maximising profits

On comparing the figures of excess of revenue over cost of manufacturing in the above statements one observes that the concern is earning more after further processing of A, C and E products but is loosing a sum of Rs 30,000 in the case of product B (if it is processed further). Hence the best production plan will be to sell A, C and E after further processing and B, D at the point of split off. The profit statement based on this suggested production plan is as below:

Profit statement based on suggested production plan

	Products					
	A	*B*	*C*	*D*	*E*	*Total*
	Rs.	*Rs.*	*Rs.*	*Rs.*	*Rs.*	*Rs.*
Sales revenue (X)	50,00,000	3,90,000	3,00,000	2,00,000	15,00,000	73,90,000
Apportioned joint Cost: (Y)	26,25,000	2,52,000	1,75,000	1,40,000	9,45,000	41,37,000

Further processing						
Cost: (Z)	12,50,000	--	50,000	--	1,50,000	14,50,000
Total manufacturing cost: (K) = (Y) + (Z)	38,75,000	2,52,000	2,25,000	1,40,000	10,95,000	55,87,000
Excess of sales revenue over manufacturing cost {(X)-(K)}	11,25,000	1,38,000	75,000	60,000	4,05,000	18,03,000
Less: Fixed cost						4,73,000
Profit						13,30,000

Hence the profit of the company has increased by Rs. 30,000

Question 12

In a chemical manufacturing company, three products A, B and C emerge at a single split off stage in department P. Product A is further processed in department Q, product B in department R and product R and product C in department S. There is no loss in further Processing of any of the three products. The cost data for a month are as under:

Cost of raw materials introduced in department P	*Rs. 12,68,800*
Direct Wages Department	*Rs.*
P	*3,84,000*
Q	*96,000*
R	*64,000*
S	*36,000*

Factory overheads of Rs 4,64,000 are to be apportioned to the departments on direct wage basis.

During the month under reference, the company sold all three products after processing them further as under:

Products	*A*	*B*	*C*
Output sold kg.	*44,000*	*40,000*	*20,000*
Selling Price per kg. Rs.	*32*	*24*	*16*

There are no Opening or Closing Stocks If these products were sold at the split off stage, that is, without further processing, the selling prices would have been Rs. 20,, Rs 22 and Rs. 10 each per kg respectively for A, B and C.

Required:

(i) Prepare a statement showing the apportionment of joint costs to joint products:

(ii) Present a statement showing product-wise and total profit for the month under reference as per the company's current processing policy.

(iii) What processing decision should have been taken to improve the profitability of the company.

(iv) Calculate the product-wise and total profit arising from your recommendation in (iii) above. *(May, 2002, 12 marks)*

Answer

(i) Statement showing the apportionment of joint costs to joint products

	Products			
	A	*B*	*C*	*Total*
Output sold Kgs.: (I)	44,000	40,000	20,000	
Selling price per kg. at split off (Rs.): (II)	20	22	10	
Sales value at split off (Rs.): (I) x (II)	8,80,000	8,80,000	2,00,000	19,60,000
Joint costs (costs incurred in department P (Rs.) *(apportioned on the basis of sales value at the point of split off) i.e. (22:22:5)*	8,80,000	8,80,000	2,00,000	19,60,000

(ii) Statement showing product-wise and total profit for the month under reference (as per the company's current processing policy)

	Products			
	A	B	C	Total
Output Kgs.: (a)	44,000	40,000	20,000	
Selling price per kg. after further processing (Rs.): (b)	32	24	16	
Sales value after further processing (Rs).: (c) = {(a) x (b)}	14,08,000	9,60,000	3,20,000	26,88,000
Joint costs (Rs.): (d) *(Refer to b (i) working notes & 2(i)*	8,80,000	8,80,000	2,00,000	19,60,000
Further processing costs (Rs.): (e) *(Refer to working note 2 (ii)*	1,72,800	1,15,200	64,800	3,52,800
Total costs (Rs.): (f) = [(d) + (e)}	10,52,800	9,95,200	2,64,800	23,12,800
Profit/ (Loss) (Rs.): [(c))– (f)}	3,55,200	(35,200)	55,200	3,75,200

Alternatively:

Incremental sales revenue (Rs.)	5,28,000	80,000	1,20,000
	(44,000 units x Rs. 12	(40,000 units x Rs. 2)	(20,000 units x Rs. 6)
Less: Further processing costs (Rs.): *[Refer to working note 2 (ii)]*	1,72,800	1,15,200	64,800
Incremental net profit / (loss)	3,55,200	(35,200)	55,200

(iii) **Processing decision to improve the profitability of the company.**

44,000 units of product A and 20,000 units of product C should be further processed because the incremental sales revenue generated after further processing is more than the further processing costs incurred. 40,000 units of product B should be sold at the point of-split off because the incremental revenue generated after further processing is less than the further processing costs.

(iv) **The product wise and total profit arising from the recommendation in (iii) above is as follows:**

Product	*A*	*B*	*C*	*Total*
Profit (Rs.)	3,55,200	--	55,200	4,10,400

Working notes:

1. **Statement of department-wise costs**

	P	Q	R	S
	Rs.	Rs.	Rs.	Rs.
Raw materials	12,68,800			
Wages	3,84,000	96,000	64,000	36,000
Overheads	3,07,200	76,800	51,200	28,800
(Apportioned on the basis of departmental direct wages i.e. 96:24:16:9)				
Total Cost	19,60,000	1,72,800	1,15,200	64,800

2. Joint costs and further processing costs

(i) Costs incurred in the department P are joint costs of products A, B and C and are equal to Rs. 19,60,000.

(ii) Costs incurred in the departments Q, R and S are further processing costs of products A, B and C respectively. Further processing costs of products A, B and C thus are Rs. 1,72, 800; Rs. 1,15,200 and Rs. 64,800 respectively.

Question 13

J B Limited produces four joint products A, B, C and D, all of which emerge from the processing of one raw material. The following are the relevant data:

Production for the period:

Joint Product	*Number of units*	*Selling price per unit*
		Rs.
A	*500*	*18.00*
B	*900*	*8.00*
C	*400*	*4.00*
D	*200*	*11.00*

The company budgets for a profit of 10% of sales value. The other estimated costs are:

	Rs.
Carriage inwards	*1,000*
Direct wages	*3,000*
Manufacturing overhead	*2,000*
Administration overhead	*10% of sales value*

You are required to:

(a) Calculate the maximum price that may be paid for the raw material.

(b) Prepare a comprehensive cost statement for each of the products allocating the materials and other costs based upon

(i) Number of units

(ii) Sales value.

Answer

Working Notes

(i) Total Sales Value:

Joint Products	*No of Units*	*Selling price per unit*	*Sales value*
		Rs.	*Rs.*
A	500	18	9,000
B	900	8	7,200
C	400	4	1,600
D	200	11	2,200
		Total	20,000

(ii) Joint Products Cost:

= Total Sales Value – Budgeted profit (10% of sales value)

= Rs. 20,000 – Rs. 2,000

= Rs. 18,000

(a) Maximum Price for the Raw Material

	Rs.	*Rs.*
Joint products cost		18,000
(Refer to Working Notes (I) & (ii)		
Less: Other Costs		
Carriage inwards	1,000	
Direct Wages	3,000	
Manufacturing Overhead	2,000	

Administration Overhead	2,000	8,000
Maximum price to be paid for the raw material		10,000

(b) (i) Comprehensive Cost Statement (Based on Units)

Joint products:

	A	*B*	*C*	*D*	*Total*
Units:	500	900	400	200	
	Rs.	Rs.	Rs.	Rs.	Rs.
Raw Material	2,500	4,500	2,000	1,000	10,000
Carriage	250	450	200	100	1,000
Direct wages	750	1,350	600	300	3,000
Manufacturing Overhead	500	900	400	200	2,000
Administration Overhead	500	900	400	200	2,000
Total Cost	4,500	8,100	3,600	1,800	18,000

(ii) Comprehensive Cost Statement (Based on Sales Value)

Joint products:

	A	*B*	*C*	*D*	*Total*
	Rs.	*Rs.*	*Rs.*	*Rs.*	*Rs.*
Sales Value	9,000	7,200	1,600	2,200	20,000
Raw Material	4,500	3,600	800	1,100	10,000
Carriage	450	360	80	110	1,000
Direct wages	1,350	1,080	240	330	3,000
Manufacturing Overhead	900	720	160	220	2,000
Administrative Overhead	900	720	160	220	2,000
Total Cost	8,100	6,480	1,440	1,980	18,000

Question 14

A company's plant processes 1,50,000 kgs. of raw material in a month to produce two products, viz, 'P' and 'Q'. The cost of raw material is Rs. 12 per kg. The process costs month are:

	Rs.
Direct Materials	*90,000*
Direct Wages	*1,20,000*
Variable Overheads	*1,00,000*
Fixed Overheads	*1,00,000*

The loss in process is 5% of input and the output ratio of P and Q which emerge simultaneously is 1:2. The selling prices of the two products at the point of split off are: P Rs.

12 per kg. And Q Rs.20 Per kg. A proposal is available to process P further by mixing it with other purchased materials. The entire current output of the plant can be so processed further to obtain a new product 'S'. The price per kg. of S is Rs. 15 and each kg of output of S will require one kilogram of input P. The cost of processing of P into S (including other materials) is Rs. 1,85,000 per month.

You are required to prepare a statement showing the monthly profitability based both on the existing manufacturing operations and on further processing.

Will you recommend further processing?

Answer

Working Notes:

		Kgs.
1.	Material input	1,50,000
	Less: Loss of Material in process (5% of 1,50,000)	7,500
	Total output	1,42,500

2. *Output of P and Q are in the ratio of 1 : 2 of the total output:*

   P = $\frac{1,42,500}{3}$ x 1 = 47,500 kg.

   Q = $\frac{1,42,500}{3}$ x 2 = 95,000 kg.

3. *Joint Costs:*

	Rs.
Material (input) (1,50,000 kg. X Rs. 12)	18,00,000
Direct materials	90,000
Direct Wages	1,20,000
Variable overheads	1,00,000
Fixed overheads	1,00,000
	22,10,000

4. *Sales Revenue of P, Q and S*

   P = 47,500 x Rs. 12 = Rs. 5,70,000

   Q = 95,000 x Rs. 20 = Rs. 19,00,000

   S = 47,500 x Rs. 15 = Rs 7,12,500.

5. *Apportionment of joint costs viz. Rs. 22,10,000 over P and Q in proportion of their sales value i.e. Rs. 5,70,000 and Rs. 19,00,000, i.e., 3 : 10 is:*

Total	*P*	*Q*
Rs	*Rs.*	*Rs.*

Joint cost apportionment	22,10,000	5,10,000	17,00,000
In the ratio of 3 : 10		$\left(\frac{Rs.22,10,000 \times 3}{13}\right)$	$\left(\frac{Rs.22,10,000 \times 10}{13}\right)$

6. *Total Cost of 47,500 kg. of S* = Joint Cost of P + Cost of Processing P into S.

= Rs. 5,10,000 + Rs. 1,85,000

= Rs. 6,85,000.

Statement showing the Monthly Profitability

	Based on existing manufacturing operations			*Based on further processing of P into S*		
	Products			*Products*		
	P	*Q*	*Total*	*S*	*Q*	*Total*
Sales quantity (kgs.)	47,500	95,000	1,42,500	47,500	95,000	1,42,500
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Sales Revenue *(Refer to working note 4)*	5,70,000	19,00,000	24,70,000	7,12,500	19,00,000	26,12,500
Less: Joint Costs *(Refer to working note 5)*	5,10,000	17,00,000	22,10,000	6,95,000	17,00,000	15,95,000
Profit	60,000	2,00,000	2,60,000	17,500	2,00,000	2,17,500

Refer to working note 6

Recommendation: Further processing of P is not recommended as it results in a lower profit of P

Question 15

A company operates a chemical process which produces four products: K, L M and N from a basic raw material. The company's budget for a month is as under:

	Rs.
Raw materials consumption	*17,520*
Initial processing wages	*16,240*
Initial processing overheads	*16,240*

Product	*Production*	*Sales*	*Additional Processing Costs after split-off*
	Kgs.	*Rs.*	*Rs.*
K	*16,000*	*1,09,600*	*28,800*
L	*200*	*5,600*	*–*
M	*2,000*	*30,000*	*16,000*
N	*360*	*21,600*	*6,600*

The company presently intends to sell product L at the point of split-off without further processing. The remaining products, K, M and N are to be further processed and sold. However, the management has been advised that it would be possible to sell all the four products at the split-off point without further processing and if this course was adopted, the selling prices would be as under:

Product	*K*	*L*	*M*	*N*
Selling Price Rs. Per kg.	*4.00*	*28.00*	*8.00*	*40.00*

The joint costs are to be apportioned on the basis of the sales value realisation at the point of split-off.

Required:

(i) Prepare the statement showing the apportionment of joint costs.

(ii) Present a statement showing the productwise and total budgeted profit or loss based on the proposal to sell product L at the split-off point and products K, M and N after further processing.

(iii) Prepare a statement to show the productwise and total profit or loss if the alternative strategy to sell all the products at split-off stage was adopted.

(iv) Recommend any other alternative which in your opinion can increase the total profit further. Calculate the total profit as also the poductwise profit or loss, based on your recommendation.

Answer

(i) Statement showing Apportionment of Joint Costs

Products	*K*	*L*	*M*	*N*	*Total (Rs.)*
Production (Kgs.): (A)	16,000	200	2,000	360	
Selling Price at split off point (Rs./Kg.): (B)	4	28	8	40	
Sales value at split off point (Rs.): (C) = (A X B)	64,000	5,600	16,000	14,400	1,00,000
Joint Cost apportionment *(Refer to Working Note)*	32,000	2,800	8,000	7,200	50,000

(ii) Statement of Total Budgeted Profit or Loss
(Based on the proposal to sell L at the split off point and products K, M and N after further processing)

Products	*K*	*L*	*M*	*N*	*Total*
	Rs.	*Rs*	*Rs.*	*Rs*	*Rs.*
Sales Revenue: (A)	1,09,600	5,600	30,000	21,600	1,66,800
Joint Cost: (B)	32,000	2,800	8,000	7,200	50,000
(Refer to Working Note)					
Addl. Processing Cost: (C) (after split off)	28,800	--	16,000	6,600	51,400
Total Cost: (D) = (B + C)	60,800	2,800	24,000	13,800	1,01,400
Profit: (A – D)	48,800	2,800	6,000	7,800	65,400

(iii) Statement of Profit or Loss
(When all the products are sold at split-off stage)

Products	*K*	*L*	*M*	*N*	*Total*
	Rs.	*Rs.*	*Rs.*	*Rs.*	*Rs.*
Sales revenue	64,000	5,600	16,000	14,400	1,00,000
Less: Joint Cost	32,000	2,800	8,000	7,200	50,000
(Refer to Working Note)					
Profit	32,000	2,800	8,000	7,200	50,000

(iv) Statement of Profit or Loss
(On the basis of another alternative)

Products	*K*	*L*	*M*	*N*	*Total*
	Rs.	*Rs.*	*Rs.*	*Rs.*	*Rs.*
Incremental sales revenue on further processing	45,600	–	14,000	7,200	
	(Rs. 1,09,600-Rs. 64,000)		(Rs. 30,000-Rs. 16,000)	(Rs. 21,600-Rs.14,400)	
Less: Additional processing Cost	28,800	–	16,000	6,600	
Profit (Loss)	16,800	–	(2,000)	600	

Since further processing of K and N adds to profit, therefore the recommended mix that would increase total profit is to process products K and N further and sell products L and M at the split - off point.

Profit and Loss statement based on recommended alternative

Products	*K* *Process further & sell*	*L* *Sell at split off*	*M* *Sell at split off*	*N* *Process further & sell*	*Total*
	Rs	*Rs.*	*Rs.*	*Rs.*	*Rs.*
Profit at split off point: (A)	32,000	2,800	8,000	7,200	
Incremental profit on sale after further processing: (B)	16,800	--	--	600	
Total: (C) = (A + B)	48,800	2,800	8,000	7,800	67,400

Working Note:

Joint Cost

= Raw material consumption + Initial processing wages + Initial processing overheads

= R. 17,520 + Rs. 16,240 + Rs. 16,240 = Rs. 50,000

Joint Cost apportionment (On the basis of sales value at split off point)

$$= \frac{\text{Joint Cost}}{\text{Total sales value}} \times \text{Sales value of the product}$$

Products	**Joint Cost apportionment**
K	$\frac{\text{Rs.}50,000}{\text{Rs.}1,00,000} \times \text{Rs.}64,000 = \text{Rs.}32,000$
L	$\frac{\text{Rs.}50,000}{\text{Rs.}1,00,000} \times \text{Rs.}5,600 = \text{Rs.}2,800$
M	$\frac{\text{Rs.}50,000}{\text{Rs.}1,00,000} \times \text{Rs.}16,000 = \text{Rs.}8,000$
N	$\frac{\text{Rs.}50,000}{\text{Rs.}1,00,000} \times \text{Rs.}14,000 = \text{Rs.}7,200$

Question 16

Three joint products are produced by passing chemicals through two consecutive processes. Output from process 1 is transferred to process 2 from which the three joint products are produced and immediately sold. The data regarding the processes for April, 1990 is given below:

	Process 1	Process 2
Direct material 2,500 kilos at Rs. 4 per kilo	*Rs. 10,000*	–
Direct labour	*Rs. 6,250*	*Rs. 6,900*
Overheads	*Rs. 4,500*	*Rs. 6,900*
Normal Loss	*10% of input*	–
Scrap value of loss	*Rs. 2 per kilo*	–
Output	*2,300 kilos*	*Joint products*
		A – 900 Kilos
		B – 800 Kilos
		C – 600 Kilos

There were no opening or closing stocks in either process and the selling prices of the output from process 2 were:

Joint product A	*Rs. 24 per kilo*
Joint product B	*Rs. 18 per kilo*
Joint product C	*Rs. 12 per kilo*

Required:

(a) Prepare an account for process 1 together with any Loss or Gain Accounts you consider necessary to record the month's activities.

(b) Calculate the profit attributable to each of the joint products by apportioning the total costs from process 2

(i) According to weight of output;

(ii) By the market value of production.

Answer

Working Notes:

(1) Joint Cost of three products under Process 2

	Rs.
By Transfer of output from process-I	20,700
Direct Labour	6,900
Overhead	6,900
Total	34,500

(2)

Joint Products	*Output in Kg.*	*Apportionment of joint cost on the basis of weight of output*
A	900	Rs. 34,500 / 23 x 9 = Rs. 13,500

B	800	Rs. 34,500 / 23 x 8 = Rs 12,000
C	600	Rs. 34,500 / 23 x 6 = Rs. 9,000

(3)

Joint Products	*Output In Kg.*	*S.P. (p.u.) Rs.*	*Sales Revenue Rs.*	*Apportionment of Joint Cost on the basis of market value of production*	
A	900	24	21,600	Rs. 34,500 / 6 x 3	= Rs. 17,250
B	800	18	14,400	Rs. 34,500 / 6 x 2	= Rs. 11,500
C	600	12	7,200	Rs. 34,500 / 6 x 1	= Rs. 5,750
			43,200		34,500

(a) **Process 1 Account**

	Kg.	*Rate per kg. (Rs.)*	*Amount Rs.*		*Kg.*	*Rate per kg.(Rs.)*	*Amount Rs.*
To Direct material	2,500	4	10,000	By Process 2	2,300	9	20,700
To Direct labour	--	--	6,250	*(Refer to Note 1)*			
To Overhead	--	--	4,500	By Normal Loss	250	2	500
To Abnormal gain	50	9	450	*(10% of input)*			
	2,550		21,200		2,550		21,200

Normal Loss Account

	Kg.	*Rate per kg. (Rs.)*	*Amount Rs.*		*Kg.*	*Rate per kg.(Rs.)*	*Amount Rs.*
To Process I	250	2	500	By Sales	200	2	400
				By Abnormal gain	50	2	100
	250		500		250		500

Abnormal Gain Account

	Kg.	*Rate per kg. (Rs.)*	*Amount Rs.*		*Kg.*	*Rate per kg.(Rs.)*	*Amount Rs.*
To Normal Loss A/c	50	2	100	By Process I	50	9	450
To Costing Profit and Loss Account			350				
	50		450		50		450

Note: Normal output = 2,500 kg. – 250 kg. = 2,250 kg

Total Cost = Direct material cost + Direct labour cost + Overheads – Recovery from scrap sales

= Rs.10,000 + Rs.6,250 + Rs.4,500 – Rs.500 = Rs.20,250

Normal cost (p.u.) = $\frac{\text{Rs.20,250}}{\text{2,250 kg}}$ = Rs. 9

(b) Statement of Profit
(attributable to each of the Joint Products according to weight of output and market value of production)

Joint products	*Output*	*S.P. (p.u.)*	*Sales value*	*Joint cost apportionment according to*		*Profit (Loss)*	*Profit*
				Weight of output	*Market value of production*		
Rs.	*Kg.*	*Rs.*	*Rs.*	*Rs.*	*Rs.*	*Rs.*	*Rs.*
1	*2*	*3*	*2x3=4*	*5*	*6*	*4-5=7*	*4-6=8*
A	900	24	21,600	13,500*	17,250**	8,100	4,350
B	800	18	14,400	12,000	11,500	2,400	2,900
C	600	12	7,200	9,000	5,750	(1,800)	1,450
	2,300		43,200	34,500	34,500	8,700	8,700

** Refer to working note 2*

*** Refer to working note 3*

Question 17

The yield of a certain process is 80% as to the main product, 15% as to the by-product and 5% as to the process loss. The material put in process (5,000 units) cost Rs. 23,75 per unit and all other charges are Rs. 14,250, of which power cost accounted for $33\frac{1}{3}$ *%. It is ascertained that power is chargeable as to the main product and by-product in the ratio of 10 : 9.*

Draw up a statement showing the cost of the by-product.

Answer

Working Note

Yield per 5,000 input units

	Yield in Percentage	*Yield in Units*
Main product	80%	4,000
By product	15%	750
Process loss	5%	250

Statement Showing the Cost of the By-Product

	Rs.
Cost of Material	18,750
$(5,000 \times \text{Rs. } 23.75) \times \frac{750}{4,750}$	
Other Charges (except power)	1,500
$(\text{Rs. } 14,250 \times 66\frac{2}{3}\%) \times \frac{750}{4,750}$	
Power	2,250
$(\text{Rs. } 14,250 \times 33\frac{1}{3}\%) \times \frac{9}{19}$	
Total Cost	22,500

Question 18

A factory is engaged in the production of a chemical BOMEX and in the course of its manufacture, a by-product BRUCIL is produced, which after further processing has a commercial value. For the month of April 1990, the following are the summarised cost data:

	Joint Expenses	*Separate Expenses*	
		BOMEX	*BRUCIL*
	Rs.	*Rs.*	*Rs.*
Materials	*1,00,000*	*6,000*	*4,000*
Labour	*50,000*	*20,000*	*18,000*
Overheads	*30,000*	*10,000*	*6,000*
Selling Price per unit		*98*	*34*
Estimated profit per unit on sale of BRUCIL		*98*	*34*
		Units	*Units*
No. of units produced		*2,000*	*2,000*

The factory uses reverse cost method of accounting for by-products whereby the sales value of by-products after deduction of the estimated, profit, post separation costs and selling and distribution expenses relating to the by products is credited to the joint process cost account.

You are required to prepare statements showing:

(i) The joint cost allocable to BOMEX.

(ii) The product-wise and overall profitability of the factory for April 1990.

Answer

Working Notes:

Computation of the share of Joint expenses allocable to the by-product BRUCIL.

		BRUCIL
1.	*By-product*	
	Units produced	2,000
	Selling price per unit (Rs.)	34
	Sales Revenue (Rs.) (2,000 x Rs. 34)	68,000
Less:	Profit (2,000 x Rs.4)	8,000
	Cost of Sales	60,000
Less:	Selling and Distribution Exp.	Nil
Less:	Expenses after separation (Rs. 4,000 + Rs. 18,000 + Rs. 6,000)	28,000
	Cost of production at the point of separation	32,000

(i) Statement of Joint Cost Allocable to BOMEX

Total Joint Expenses	*Rs.*	*Rs.*
Material	1,00,000	
Labour	50,000	
Overhead	30,000	1,80,000
Less: Joint Cost allocable to the production of 2,000 units of BRUCIL at the point of separation *(See Working Note 1)*		32,000
Cost of production of 2,000 units of BOMEX		1,48,000

(ii) Productwise and Overall profitability Statement of the month of April, 1990

		Products			
		BOMEX		*BRUCIL*	*Total Rs.*
Sales (units)		2,000		2,000	
Selling price (Rs.)		98		34	
Sales Revenue (Rs.)		1,96,000		68,000	
Less: Cost of production at the point of separation	1,48,000		32,000		
Less: Post separation cost	36,000	1,84,000	28,000	60,000	
Profit (Rs.)		12,000		8,000	20,000

Question 19

Distinguish between Joint products and By-products.

Answer

Joint products and By-products: Joint Products are defined as the products which are produced simultaneously from same basic raw materials by a common process or processes but none of the products is relatively of more importance or value as compared with the other. For example spirit, kerosene oil, fuel oil, lubricating oil, wax, tar and asphalt are the examples of joint products.

By products, on the other hand, are the products of minor importance jointly produced with other products of relatively more importance or value by the common process and using the same basic materials. These products remain inseparable upto the point of split off. For example in Dairy industries, batter or cheese is the main product, but butter milk is the by-product.

Points of Distinction:

(1) Joint product are the products of equal economic importance, while the by-products are of lesser importance.

(2) Joint products are produced in the same process, whereas by-products are produced from the scrap or the discarded materials of the main product.

(3) Joint products are not produced incidentally, but by-products emerge incidentally also.

Question 20

A company produces two joint product X and Y, from the same basic materials. The processing is completed in three departments.

Materials are mixed in department I. At the end of this process X and Y get separated. After separation X is completed in the department II and Y is finished in department III. During a period 2,00,000 kgs of raw material were processed in department I, at a total cost of

Rs. 8,75,000, and the resultant 60% becomes X and 30% becomes Y and 10% normally lost in processing.

In department II 1/6 of the quantity received from department I is lost in processing. X is further processed in department II at a cost of Rs. 1,80,000.

In department III further new material added to the material received from department I and weight mixture is doubled, there is no quantity loss in the department and further processing cost (with material cost) is Rs. 1,50,000.

The details of sales during the year:

	Product X	*Product Y*
Quantity sold (kgs)	*90,000*	*1,15,000*
Sales price per kg (Rs.)	*10*	*4*

There were no opening stocks. If these products sold at split-off-point, the selling price of X and Y would be Rs. 8 and Rs. 4 per kg respectively.

Required:

(i) Prepare a statement showing the apportionment of joint cost to X and Y in proportion of sales value at split off point.

(ii) Prepare a statement showing the cost per kg of each product indicating joint cost, processing cost and total cost separately.

(iii) Prepare a statement showing the product wise profit for the year.

(iv) On the basis of profits before and after further processing of product X and Y, give your comment that products should be further processed or not.(2+3+2+2= 9 marks)

Answer

Calculation of quantity produced

	Dept I	*Dept II*	*Dept III*
Input (kg)	2,00,000	1,20,000	60,000
Weight lost or added	(20,000)	(20,000)	60,000
	1,80,000	1,00,000	1,20,000
Production of X	1,20,000	1,00,000	
Production of Y	60,000		1,20,000

(i) Statement of apportionment of joint cost

(Joint cost Rs. 8,75,000)

	Product X	Product Y
Out put (kg)	1,20,000	60,000
Selling price per kg (Rs.)	8	4
Sales value (Rs.)	9,60,000	2,40,000
Share in Joint cost (4:1)	7,00,000	1,75,000

(ii) Statement of cost per kg

	Product X	*Product Y*
Share in joint cost (Rs.)	7,00,000	1,75,000
Out put (kg)	1,00,000	1,20,000
Cost per kg (Rs.) (Joint cost)	7.00	1.458
Further processing cost per kg (Rs.)	1.80	1.250
Total cost per kg (Rs.)	8.80	2.708

(iii) Statement of profit

	Product X	*Product Y*
Out put (kg)	1,00,000	1,20,000
Sales (kg)	90,000	1,15,000
Closing stock	10,000	5,000
	Rs.	*Rs.*
Sales @ Rs. 10, 4(for product X and Y)	9,00,000	4,60,000
Add: closing stock (kg) (at full cost)	88,000	13,540
Value of production	9,88,000	4,73,540
Less: Share in joint cost	7,00,000	1,75,000
Further processing	1,80,000	1,50,000
Profit	1,08,000	1,48,540

(iv) Profitability statement, before and after processing

	Product X	*Product X*	*Product Y*	*Product Y*
	Before (Rs.)	*After (Rs.)*	*Before (Rs,)*	*After (Rs)*
Sales Value	9,60,000		2,40,000	
Share in joint costs	7,00,000		1,75,000	
Profit	2,60,000	1,08,000 (as per iii above)	65,000	1,48,540 (as per iii above)

Product X should be sold at split off point and product Y after processing because of higher profitability.

Question 21

Discuss the treatment of by-product Cost in Cost Accounting. *(November 2007, 3 Marks)*

Answer

Treatment of by-product cost in Cost Accounting:

(i) When they are of small total value, the amount realized from their sale may be dealt as follows:

- Sales value of the by-product may be credited to Profit and Loss Account and no credit be given in Cost Accounting. The credit to Profit and Loss Account here is treated either as a miscellaneous income or as additional sales revenue.
- The sale proceeds of the by product may be treated as deduction from the total costs. The sales proceeds should be deducted either from production cost or cost of sales.

(ii) When they require further processing:

In this case, the net realizable value of the by product at the split-off point may be arrived at by subtracting the further processing cost from realizable value of by products. If the value is small, it may be treated as discussed in (i) above.

12
Cost Audit

Question 1

Define Cost Audit, How it is useful:

(1) To the Management

(2) To the Society

(3) To the Shareholders, and

(4) To the Government? *(May, 1999, 2000, 2003, Nov, 2008 4 marks)*

Answer

According to the Institute of Cost and Management Accountants of England, Cost Audit is defined as the verification of Cost Accounts and a check on the adherence to the Cost Accounting plan. The cost audit, therefore comprises:

(a) the verification of the cost accounting records such as the accuracy of the cost accounts, cost reports, cost statements, cost data, costing techniques and

(b) examining these records to ensure that they adhere to the cost accounting principle, plans, procedures and objectives.

Usefulness of Cost Audit

Cost audit will prove to be useful to the management, society, shareholders and the government as shown below.

(1) Usefulness to the Management :

(i) The management will get reliable data for its day to day operations like price fixing, control, decision making, etc.

(ii) A close and continuous check on all wastages will be kept through a proper system of reporting to the management.

(iii) Inefficiencies in the working of the company will be brought to the notice of the management to take corrective action.

(iv) Management by exception becomes possible through allocation of responsibilities to individual managers.

(v) The system of budgetary control and standard costing will be greatly facilitated.

(vi) A reliable check in the valuation of closing stock and work-in-progress can be established.

(vii) It helps in the detection of errors and fraud.

(2) Usefulness to the Society :

(i) Cost audit is often introduced for the purpose of fixation of price. The prices so fixed are based on the correct costing data and so the consumers are saved from exploitation.

(ii) Price increase by the industry is not allowed without proper justification as to increase in cost of production, consumers are saved from unreasonable price hike.

(iii) Cost Audit is also useful for the purpose of Cost Control; Cost reduction and proper utilisation of scarce resources.

(3) Usefulness to Shareholders :

(i) Cost audit ensures that proper records are kept as to purchases and utilisation of material and expenses incurred on wages, overheads, etc. It also ensures that the unit has been run economically and efficiently. It also makes sure that the valuation of closing stocks and work-in-progress is on a fair basis. Thus, the shareholders are assured of a fair return on their investment.

(4) Usefulness to the Government :

(i) Where the government enters into a cost plus contract, cost audit helps the government to fix the price of the contract.

(ii) Cost audit helps the fixation of selling prices of essential commodities and thus undue profiteering is checked.

(iii) Cost audit enables the government to focus its attention on inefficient units.

(iv) Cost audit enables the government to decide in favour of giving protection to certain industries.

(v) Cost audit facilitates settlement of trade disputes brought to the government.

(vi) Since cost audit ensures efficient running of the business and correct and accurate use of cost data, a healthy competition is generated among the various units in an industry. This imposes an automatic check on inflation.

Question 2

What are the important aspects of cost audit? How is it useful to the shareholders of a company? (Nov., 1997, 6 marks)

Answer

Important aspects of Cost Audit:

Cost audit offers valuable assistance to the management in its decision-making process by examining the reliability of cost accounting data and information. Due to the assistance provided by cost audit, management is in a position to know what price is to be fixed for a product, whether the wastages are avoidable, whether to re-organise sales or inventory system, to make the work more efficient and so on. Also cost audit is of great help in

maintaining internal control and internal check and can be of advantage even to the statutory financial auditor. Cost audit, apart from having all the normal ingredient of audit. I.e., vouching, verification etc., has within its domain elements of efficiency audit propriety audit as well.

Efficiency audit is directed towards the measurement of whether corporate plans have been effectively executed. It is concerned with the utilisation of the resources in economic and most remunerative manner to achieve the objectives of the concern. It comprises of studying the plans of organisation, comparing actual performance with plans and investigating the reasons for variances to take remedial action. For example, the effective utilisation of capital in an organisation can be guaged by determining the return on capital employed.

Propriety audit is concerned with the executive actions and plans bearing on the finances and expenditure of the company. The cost auditor has to judge:

(a) Whether the planned expenditure is designed to give optimum results.

(b) Whether the size and channels of expenditure were designed to produce the best results.

(c) Whether the return from expenditure on capital as well as current operations could be bettered by some other alternative plan of action.

Usefulness of Cost audit to shareholders:

Cost audit ensures that proper records are kept as to purchases and utilisation of materials and expenses incurred on wages, overheads etc. It also ensures that the unit has been run economically and efficiently. It also makes sure that the valuation of closing stocks and work-in-progress is on a fair basis. Thus, the shareholders are assured of a fair return on their investment.

Question 3

Define Cost Audit and state its purposes. *(May, 2001 & November,2002, 3 marks)*

Answer

Definition of Cost Audit: It is defined as the verification of cost accounts and a check on the adherence of Cost Accounting plan. It in fact comprises of:

(i) The verification of cost accounting records such as accuracy of the cost accounts, cost reports, cost statements, cost data, costing techniques.

(ii) Examining cost accounting records to ensure that they adhere to the cost accounting principles, plan, procedures and objectives.

In other words, the Cost Auditor ensures that the cost accounting plan is in accordance with the objectives established by the management and in conformity with the appropriate system of cost accounting.

Broadly, the purposes of cost audit can be classified as (I) Protective, and (ii) Constructive.

Protective purpose : In examines that there is no undue wastage or losses and the costing system brings out the correct and realistic cost of production or processing.

Constructive purpose: It provides management with information useful in regulating production, choosing economical methods of operation, reducing operations costs and reformulating plans etc.

Question 4

Distinguish between: Efficiency audit and Proprietary audit? (May, 2003, 2007, 2 marks)

Answer

Efficiency audit & Propriety audit: Efficiency audit is directed towards the measurement of whether corporate plans have been effectively executed. It is concerned with the utilisation of resources in economic and most remunerative manner to achieve the objectives of the concern. It comprises of studying the plans of organisation, comparing actual performance with plans and investigating the reasons for variances to take remedial action. For example, the effective utilization of capital in an organization can be gauged by determining return on capital employed.

Propriety audit is concerned with executive actions and plans bearing on the finances & expenditure of the company. The cost auditor has to judge:

(a) Whether the planned expenditure is designed to give optimum results.

(b) Whether the size and channels of expenditure were designed to produce the best results, and

(c) Whether the return from expenditure on capital as well as current operations could be bettered by some other alternative plan of action.

Question 5

What as a Cost Auditor, will you verify in the area of work-in-progress?

(Nov., 1996,May, 2002, 4 marks)

Answer

The Cost Auditor should verify the following area of work-in-progress:

1. That the work-in-progress has been physically verified and it agrees with the quantity shown in job-cards of uncompleted work.
2. That the valuation of the work-in-progress is correct with reference to the stage of completion of each job or process and the value job cost cards or process cost sheet.
3. That there is no over-valuation or under valuation of opening work-in-progress or closing work-in-progress, thereby artificially, pushing up and down net profits or net assets as the case may be.
4. That the volume and value of work-in-progress is not disproportionate as compared with finished production.

Question 6

Distinguish between cost audit & statutory audit? (Nov., 2004, 2 marks)

Answer

Cost audit and statutory audit

Cost audit offers valuable assistance to the management in its decision-making process by examining the reliability of cost accounting data and information. Due to the assistance provided by cost audit, management is in a position to know what price is to be fixed for a product, whether the wastages are avoidable whether to reorganise sales or inventory system to make work more efficient and effective. Cost audit, apart from all the normal ingredients of audits. i.e. vouching, verification etc has been within its domain elements of efficiency audit and proprietary audit.

Statutory audit of accounts is to examine whether P/L A/c Balance Sheet of a company provides a true and fair view of profits (in the relevant financial period) and financial position on a particular date.

Question 7

Discuss the purpose of cost Audit, and circumstances under which a cost audit is desirable? (Nov., 1999, 2003, 3 marks)

Answer

Purpose of Cost Audit: Cost Audit is conducted to examine whether the costs compiled as per the cost records are correct or not. It involves not only the verification of basic cost records relating to material, wages and overheads to ascertain the correctness of the cost of production, but also to make technical estimates, etc. to know what the cost should have been. Cost records are the basis of costs and reformulating plans etc on the basis of these findings during the course of ascertaining cost, determining price and taking various other decisions. It is therefore, necessary that the accuracy of these records is examined by an independent person who can bring into light the errors, omissions or fraud if any, committed in the maintenance of cost records.

Broadly cost audit has protective as well as constructive purpose.

Under protective purpose, it aims at examining that there is no undue wastage or losses and the costing system brings out the correct and realistic cost of production or processing. The cost auditor plays a constructive role by providing management of the company with information useful for regulating production, choosing economical methods of operation, reducing operations cost audit.

Circumstances under which a cost audit is ordered / desirable are as follows:

(i) Price fixation – specially in the case of materials of national importance like steel cement etc.

(ii) Cost variation within the industry – cost audit is essential for that industry where cost variations is significant from unit to unit to ascertain reasons for such variations.

(iii) Inefficient management – cost audit helps to provide information to government about inefficient units for taking further necessary action.

(iv) Tax assessment – cost audit determines correct cost of production so as to facilitate correct tax computation.

(v) Trade disputes – cost audit is useful in setting trade disputes about the claim for higher wages, bonus etc.

Question 8

As a cost auditor what will you verify on the area of 'overheads and indirect expenditure'?

(Nov., 1995, 3 marks)

Answer

A cost Auditor must verify the following aspects in the area of 'overheads and indirect expenditure'.

(i) that allocation of indirect expenditure over production, sales, and distribution is logical and correct;

(ii) that compared with the value of production in a production shop, the overleaf charges are not excessive;

(iii) that the actual indirect expenditure does not exceed budgets or standard expenditure significantly and that any variations are satisfactorily explained and accounted for;

(iv) that the relation of indirect expenditure in keeping with the load on individual production shop is appropriate;

(v) correctness of appropriate allocation of overhead expenditure (both production and sales) will be certified by Cost Auditor;

(vi) that allocation of overheads between finished products and unfinished products is in accordance with correct principles.

Question 9

Define Cost Audit. Indicate the circumstances under which a cost audit is ordered?

(Nov., 1994, 8 marks)

Answer

Cost Audit is defined as the verification of cost accounts and a check on the adherence the cost accounting plan. The cost audit, therefore, comprises:

(i) The verification of cost accounting records such as accuracy of the cost accounts, cost reports, cost statements, cost data, costing techniques;

(ii) Examining these-records to ensure that they adhere to the cost accounting principles, plans, procedures and objectives.

In other words, the Cost Auditor ensures that the cost accounting plan is in accordance with the objectives established by the management and in conformity with the appropriate system of cost accounting.

Circumstances under which Cost Audit is ordered

Section 209 of the Companies Act, 1956 empowers the Government of India to order companies engaged in production, processing, manufacturing or mining activities to maintain cost records in the prescribed manner relating to utilisation of material, labour and other items of cost. This would enable the management to identify the areas of inefficiencies and high costs and take immediate corrective action. In exercise of these powers, the Department of Company Affairs, Government of India, has issued the 'Cost Accounting (Records) Rules' in respect of a number of products/industries which are consumer oriented and earners of high profit margin.

Apart from the aforesaid reasons for going in for cost audit, the under mentioned circumstances may warrant the introduction of cost audit:

(i) Pricing Fixation:

The need for fixation of retention price in the case of materials of national importance like steel, cement etc. may cause a necessity for cost audit. Also to check excessive profiteering, cost audit may be useful in knowing the true cost of production.

(ii) Cost variation within the industry:

Where the cost of production varies significantly from unit to unit in the same industry, cost audit may be necessary to find the reasons for such differences.

(iii) Inefficient Management:

Where a factory is run in-efficiently and uneconomically, institution of cost audit may be necessary. It may be particularly useful for the Government before taking up any further action.

(iv) Tax assessment :

Where a duty or tax is levied on products based on cost of production, the levying authorities may ask for cost audit to determine the correct cost of production.

(v) Trade Disputes:

Cost audit may be useful in settling trade disputes about claim for higher wages, bonus etc.

Question 10

What are the areas of activity, which a Cost Audit Programme is expected to cover?

(Nov., 2000, 3 marks)

Answer

Cost audit offers valuable assistance to the management in its decision making process by examining the reliability of cost accounting data and information.

Due to the assistance provided by cost audit, management is in a position to know what price is to be fixed for a product, whether the wages are avoidable, whether to reorganise sales or inventories systems to make the work efficient and so on. Also, cost audit is of great help in maintaining internal control and internal check and can be of advantage even to the

statutory financial auditor. Cost audit programme apart from having all the normal ingredients of audit i.e., vouching, verification etc., is expected to cover within its domain the areas of activity which are concerned with efficiency and propriety audit of the concern as well.

(i) *Efficiency audit:* It is directed towards the measurement of whether corporate plans have been effectively executed. It is concerned with the utilisation of the resources in economic and most remunerative manner to achieve the objectives of the concern. It comprises of studying the plans of organisation, comparing actual performance with plans and investigating the reasons for variances to take remedial action. For example, the effective utilisation of capital in an organisation can be guaged by determining the return on capital employed.

(ii) *Propriety audit:* It is concerned with the executive actions and plans bearing on the finances and expenditure of the company. The cost auditor has to judge:

  (a) whether the planned expenditure is designed to give optimum results;

  (b) whether the size and channels of expenditure were designed to produce the best results; and

  (c) whether the return from expenditure on capital as well as current operations could be bettered by some other alternative plan of action.

13
Cost Accounting (Records) Rules

Question 1

Write a brief note on Cost Accounting Record Rules. *(May, 1999, 3 marks)*

Answer

Cost Accounting Record Rules: The Government of India had issued 'Cost Accounting Record Rules' in respect of number of products / industries (as listed under section 209 (1) (d) of Companies Act). Before the imposition of Statutory Cost Audit it is expected from all such concerns to observe these rules. Such an audit is imposed in respect of those products / industries which are consumer oriented and earners of high profit margin. According to these rules, all companies engaged in activities of production or manufacturing, etc. (for which cost accounts records have been prescribed) should maintain accounting records relating to the utilisation of materials, labour and other items of cost. Such books of account should facilitate the calculation and disclosure of cost of production and cost of sales of the products at a periodical intervals. Each book of account and the proforma prescribed by the rules should be completed within the prescribed time limit after the end of the relevant financial year of the company. The following are the main requirements of Cost Accounting (Records) Rules generally applicable to various industries in India. .

1. Records for raw materials.
2. Records for labour.
3. Records for overheads.
4. Records for utilities / services.
5. Records for fixed assets.
6. Records for packing.
7. Records for research and development expenses.
8. Records for conversion cost.
9. Records for by-products.

10. Records for work-in-progress and finished goods.
11. Records for cost of production and marketing.
12. Reconciliation of cost records with financial books.
13. Computation of variances.
14. Physical verification.
15. Statistical data.

Question 2

State the areas of activity for which accounting records are to be maintained under Cost Accounting Record Rules. *(May, 2001, 3 marks)*

Answer

Areas of activity for which accounting records are to be maintained under Cost Accounting Record Rules

Costing Accounting Record Rules: The Government of India had issued Cost Accounting Record Rules, in respect of number of products industries (as listed under section 209(I) (d) of Companies Act). Before the imposition of Statutory Cost Audit it was expected from all such concerns to observe these rules. Such an audit is imposed in respect of those products, industries which are consumer oriented and earners of high profit margin. According to these rules, all companies engaged in activities of production or manufacturing, etc. (for which cost accounts records have been prescribed) should maintain accounting records relating to the utilisation of materials, labour and other items of cost. Such books of account should facilitate the calculation and disclosure or cost of production and cost or sales of the products at a periodical intervals. Each books of account and the proforma prescribed by the rules should be completed within the prescribed time limit after the end of the relevant financial year of the company. Following records are to be maintained under Cost Accounting (Record) Rules generally applicable to various industries in India.

1. Records for raw materials, components. stores & spare parts.
2. Records for labour.
3. Records for overheads.
4. Records for utilities / services.
5. Records for fixed assets.
6. Records for packing

7. Records for research mid development expenses.
8. Records for conversion cost.
9. Records for by-products.
10. Records for work-in-progress and finished goods.
11. Records for cost of production and marketing.
12. Reconciliation of cost records with financial books.
13. Computation of variances.
14. Physical verification.
15. Statistical data.

Question 3

Mention any eight areas of maintenance of Cost Accounting Records.

(Nov., 1994, 8 marks)

Answer

The eight areas (it refers to No. of products/industries) of maintenance of cost accounting records are as under:-

(i) Raw materials, components, stores and spare parts etc.

(ii) Wages and Salaries.

(iii) Overheads.

(iv) Utilities.

(v) Service department expenses including workshop repair and maintenance.

(vi) Depreciation.

(vii) Royalty / Technical knowhow fee.

(viii) Research and development expenses.

Besides above, the cost accounting records may also be maintained for the following:

(a) Packing expenses; (b) Interest; (c) Expenses/incentive on export;

(d) Conversion Cost; (e) Captive consumption; (t) Credit for by-products

(g) Work-in-progress and finished goods stock; (h) Production records (i) Cost statements;

(j) Reconciliation with financial accounts and adjustment of cost variances;

(k) Stock verification records; (l) Inter-company transactions;

(m) Statistical Statements and other records.

Question 4

Discuss the various reports provided by Cost Accounting department. (Nov, 2007, 4 marks)

Answer

The following are the various Reports provided by Cost Accounting Department:

(i) Cost sheet setting out the total cost, analysed into various elements, giving comparative figure of previous period and other plants under the same management.

(ii) Consumption of material statements.

(iii) Labour utilization statements, details about total number of hours paid for, standard hours for output, idle time and causes thereof.

(iv) Overheads incurred compared with budgets.

(v) Reconciliation of actual profit earned with estimated or budgeted profit.

(vi) Total cost of abnormally spoiled work in the factory and abnormal loss and store.

(vii) Total cost of inventory carried, number of monthly stocks would be sufficient.

(viii) Labour turnover and cost of recruitment and training of new employee.

(ix) Expenses incurred on R & D as compared to budgeted amount.

14
Uniform Costing

Question 1

Define uniform costing. What are the essential requisites for the installation of a uniform costing system? (Nov., 2000, 2007, 6, 4, marks)

Answer

Uniform Costing

Uniform Costing is not a distinct method of costing, Infact when several undertaking start using the same costing principles and / or practices, they are said to be following uniform costing. The basic idea behind uniform costing is that the different concerns in an industry should adopt a common method of costing and apply uniformly the same principles and techniques for better cost comparison and common good. The principles and methods of compilation, analysis, apportionment and absorption of overheads differ from one concern to the other in the same industry, but if a common or uniform pattern is adopted by all, it helps mutually in cost control and cost reduction.

The essential requisites for the installation of uniform costing system

A successful system of uniform costing requires the following essential requisites for its installation:

1. The firms in the industry should be willing to share /furnish relevant data /information.
2. A spirit of co-operation and mutual trust should prevail among the participating firms.
3. Mutual exchange of ideas, methods used, special achievements made, research and know-how etc. should be frequent.
4. Bigger firms should take the lead towards sharing their experience and know-how with the smaller firms to enable the latter to improve their performance.
5. Uniformity must be established with regard to several points before the introduction of uniform costing in an industry. In fact, uniformity should be with regard to following points
   (a) Size of the various units covered by uniform costing.
   (b) Production methods.
   (c) Accounting methods, principles and procedures used.

Question 2

Explain in brief the advantages and limitations of uniform costing.

(November,1996, 98, 99, May,2001,2004, 4 marks)

Answer

Uniform costing refers to the use of the same costing principles and practices by several undertakings. These undertakings may or may not be under the same management. Adherence to the same costing methods and procedures specially when there can be two or more options is the characteristic feature of a uniform system of costing.

Advantages of uniform costing:

(i) The management of an individual firm / unit will be saved of the botheration of developing and introducing a costing system of their own.

(ii) A uniform costing system for the firms in the same industry is provided for the adoption of such undertakings. Since the system is devised by manual consultation and after considering the difficulties and circumstances prevailing in the various undertakings, therefore it is readily adopted and successfully implemented.

(iii) It facilitates comparison of cost figures of various firms. Such a comparison enables the firms to identify their weak and strong points and control costs effectively and efficiently.

(iv) The availability of cost data of other firms in the industry enables each firm to know its standing in the industry.

(v) The benefits of research and development of bigger firms are made available to smaller firms at no cost.

(vi) This system of costing requires the introduction of a uniform wage system in all the firms in the industry. The introduction of a uniform wage system reduces labour turnover.

(vii) It helps trade associations in negotiating with the government in trade matters, particularly, when an industry seeks any assistance or concession from the government in matters of subsidies, exports, taxation, duties and price determination, etc.

(viii) Uniform costing is of great help in price fixation. Unhealthy competition is avoided between the firms in the same industry in framing policies and submitting tenders.

(ix) It helps the government also in regulating the prices of essential and important items such as bread, flour, sugar, cement and steel etc.

Limitations of uniform costing:

(i) Due to the differing circumstances in which firms operate, it is difficult to have uniform standards, methods and procedures of costing. This renders the adoption of uniform costing difficult.

(ii) Adoption of a uniform costing system requires various firms to disclose their cost and other data. Some of the firms do not like this and are thus hesitant towards the use of this costing system.

(iii) Small firms feels that uniform costing system is meant only for large and medium size firms and thus they cannot afford it.

(iv) Some feels that the use of this system of costing may lead to monopolistic tendencies resulting in artificially raised higher prices and curtailing supplies.

Question 3

Write a short note on uniform costing. *(May, 1996, 3 marks)*

Answer

Uniform Costing: It has been defined by the Institute of Cost and Works Accountants of England as ''The use by several undertaking of the same costing principles and/or practices''. Thus when a number of undertaking, whether under the same management or not, decide to adhere to one set of accepted costing principles especially in matters where there can be two opinions – they are said to be following uniform costing. It makes inter firm comparison easy and, of course, one of the aims of uniform costing is to introduce inter-firm comparison. Use of uniform costing is comparatively easy among concerns manufacturing the same type of products.

A great deal of spade work is required to be done before the introduction of uniform costing in an industry. Its introduction helps the firms to submit reliable cost data to price fixing bodies to determine the average cost and fixing the fair selling prices of various products. It serves as a pre-requisite to cost audit.

Question 4

State the essential pre-requisites for the installation of uniform costing system in an industry?

(November, 2002) (5 marks)

Answer

The essential pre-requisites for the installation of uniform costing system in an industry are

(i) Firms in the industry should be willing to share / furnish relevant information.

(ii) A spirit of cooperation and mutual trust should prevail among participating firms.

(iii) Exchange of ideas and methods, share of achievements in areas of efficiency and research, should be frequent.

(iv) There should be no jealously or rivalry among the participating units.

(v) Bigger firms should take the lead towards sharing their experience with the smaller firms.

Question 5

What are the requisites for installation of a Uniform Costing System? (May 1996, 6 marks)

Answer

Requisites for the installation of a uniform costing system:

(i) The firms in the industry should be willing to share/furnish relevant data/information

(ii) A spirit of cooperation and mutual trust should prevail among the participating firms

(iii) Mutual exchange of ideas, methods used, special achievements made research and know-how etc., should be frequent.

(iv) Bigger firms should take the lead towards sharing their experience and know-how with the smaller firms to enable the latter to improve their performance.

(v) Uniformity must be established with regard to several points before the introduction of uniform costing in an industry. In fact, uniformity should be with regard to following points.

1. Size of the various units covered by uniform costing.
2. Production methods.
3. Accounting methods, principles and procedures used.

Question 6

Write notes on points on which uniformity is essential before introducing uniform costing.

(May, 1998, Nov.2002, 4 marks)

Answer

Points on which Uniformity is essential before introducing Uniform Costing :

The points in respect of which uniformity is required to be established before the introduction of uniform costing in an industry are as below:

(i) Uniformity in the size of various units where uniform costing is to be introduced:

The size of units should be more or less the same which are to be brought under uniform costing. Units differing in size should be classified in a number of categories according to their size. Since the cost structure in an organisation is influenced by its size, the classification of units based on their size would make the cost statements of these units more comparable.

(ii) Uniformity in the production method:

All units in an industry should use uniform methods of production.

(iii) Uniformity in the accounting method, principles and procedures:

In fact, the uniformity should be achieved in respect of following:

1. Identifying stages of production where costs are to be measured.
2. Same methods of valuing inventory should be used.
3. Cost unit.
4. Classification of costs and its components.
5. Identifying methods of pricing material issues.
6. Methods of remunerating and providing incentives to labour.
7. Basis of allocation and apportionment of overheads.

8. Basis of distribution and redistribution of overheads.
9. Methods of depreciation.
10. Treatment of notional expenses
11. Treatment of material losses.
12. Allocation / apportionment of joint costs.
13. Preparation of cost statements, reports and their submission schedule.

Question 7

Enumerate the points on which uniformity is essential before introducing uniform costing system? (May, 2002, 4 marks)

Answer

Points on which uniformity is essential before introducing uniform costing system are:

1. The firms in the industry should be willing to share / furnish relevant data/ information.
2. A spirit of cooperation and mutual trust should prevail among the participating firms.
3. Mutual exchange of ideas, methods used, special achievements made, research and know-how etc. should be frequent.
4. Bigger firms should take the lead towards sharing their experience and know-how with the smaller firms to enable the latter to improve their performance.
5. Uniformity must be established with regard to several points before the introduction of uniform costing in an industry. In fact, uniformity should be with regard to following points:
   (a) Size of the various units covered by uniform costing.
   (b) Production methods
   (c) Accounting methods, principles and procedures used.

Question 8

Write short notes on Uniform Cost Manual? (Nov., 1994) (4 marks)

Answer

Uniform Cost Manual: It is a written document, which may be in the form of a booklet or bulletin, containing the principles, methods and procedures for the ascertainment and control of cost in uniform costing. It is necessary for the successful operation of uniform costing system. Such a manual provide guidelines to the participating firms to organise their cost accounting system on a uniform basis.

The following are the salient features of a uniform cost manual.

1. It includes statement of objectives and purpose of the system, scope of the system, advantages and extent of co-operation necessary.
2. It contains the general principles of accounting, nature coding, terminology to be followed, classification and description of accounts. This section also includes details of stock control, labour and overhead cost collection and control.
3. Essential cost data and various ratios to be computed for comparison of performance and efficiency in the operation of the participating units.
4. Mode, format and time for presenting cost data and reports to the management.
5. It provides necessary guidelines about the treatment of depreciation, interest on capital, wastage, scrap, by-product, etc.

Question 9

A firm of printers is contemplating joining the uniform costing system being operated by its Trade Association but the Managing Director is doubtful about the advantages of becoming involved in the scheme.

Prepare a report to the Managing Director describing the advantages that the firm is likely to gain. *(Nov., 1995, 7 marks)*

Answer

Dated .....

From : Cost Accountant

Re : Report on the advantages accruing from becoming a member of uniform costing system operated by the Trade Association

I heard that you are contemplating of joining uniform costing system operated by Trade Association. I also support this idea of joining such a system because of multiple benefits which would accrue from it. Such a step would strengthen not only the capability of decision making of our executives but may also enable them to achieve other cost accounting objectives. The main advantages of joining uniform costing system group are as follows:

1. Saved from the exercise of developing and introducing an individual costing system.
2. A costing system devised by mutual consultation and after considering the difficulties and circumstances prevailing in different firms may be readily adopted and successfully implemented.
3. A comparison of cost figures of various firms of the system will facilitate the firms to identify their weak and strong points besides controlling costs.
4. Standing of the firms in the industry would be known by making a comparison of its cost data with others.

5. Research and development benefits of bigger firms may be made available to smaller firms.
6. It helps Trade Associations in negotiating with the Government for any assistance or concession in the matters of taxation, export subsidies, duties and price determination etc.
7. Unhealthy competition is avoided among the firms in the same industry in framing pricing policies and submitting tenders.
8. Prices fixed on the basis of uniform costing are representative of the whole industry.
9. Facilitates the reduction of labour turnover, as a uniform wage system is the precondition of a uniform costing system.
10. It provides a basis for the comparative assessment of the performance of two firms in the same industry but in different sectors.
11. It will facilitate the development/introduction of information system.
12. Optimum achievement of efficiency may be attempted by utilising the experience of other concerns in the system.

Question 10

Explain, what do you understand by uniform costing? Discuss the points in respect of which uniformity is required to be established before introduction of uniform costing in an industry.

Answer

Uniform Costing has been defined by the Institute of Cost and Works Accountants of England as 'The use by several undertakings of the same costing principles and/or practices' Thus when a number of undertakings, whether under the same management or not, decide to adhere to one set of accepted costing principles – especially in matters where these can be two opinions—they are said to follow uniform costing. It makes inter-firm comparison. Use of uniform costing is comparatively easy among concerns manufacturing the same type of products.

A great deal of spade work is required to be done before the introduction of uniform costing in an industry. The consideration of the following points is a must before the introduction of uniform costing in an industry.

(i) Classification of various units according to size : The various units to be brought under a system of uniform costing may differ both in size and in their organisational set-up. Therefore, it is desirable to classify such units according to their size. If this is not done, the cost statements prepared would not be comparable since cost structure of firms varies according to their size.

(ii) Uniformity in methods and principles used for measuring output and collecting costs: For the introduction of uniform costing system it is necessary to bring uniformity in cost collection and its determination. These objectives may be achieved by establishing uniformity in respect of the following points.

(a) Establishing the stage of production at which costs may be measured. A clear-cut instruction in this regard is quite useful.

(b) Identifying methods to be used for quantifying production, specially with regard to work-in-progress.

(c) Determination of cost unit to which cost should be related.

(d) Classification and grouping of expenses.

(e) The principles to be followed while determining direct and indirect expenses and variable and fixed expenses.

(f) Basis of apportionment of expenses. It is important to specify the method by which the various overheads would be apportioned over various departments and cost units.

(g) The basis for charging service department expenses to production departments.

(h) The method of depreciation to be followed.

(i) National expenditure to be considered and expenses to be ignored in cost accounting.

(j) Standardisation of cost statements, forms and their submission schedule.

(k) The treatment of wastages, scrap, by-products, overtime, donations, and under or over absorbed overheads.

From the foregoing it is apparent that it is essential to bring uniformity in respect of the above points before introducing uniform costing in an industry.

15
Inter-firm Comparison

Question 1

What is meant by 'Inter-firm comparison'? Describe the requisites to be considered while installing a system of inter-firm comparison. (May, 1995 & Nov, 1997, 8 marks)

Answer

It is the technique of evaluating the performance efficiency, costs and profits of firms in an industry. It consists of voluntary exchange of information/data concerning costs, prices, profits, productivity and overall efficiency among firms engaged in similar type of operations for the purpose of bringing improvement in efficiency and indicating the weaknesses. Such a comparison will be possible where uniform costing is in operation.

An inter-firm comparison indicates the efficiency of production and selling, adequacy of profits, weak spots in the organisation, etc and thus demands from the firm's management an immediate suitable action. Inter-firm comparison may enable the management to challenge the standards which it has set for itself and to improve upon them in the light of the current information gathered from more efficient units. Such a comparison may be pharmaceuticals, cycle manufacturing, etc.

Requisites of Inter-firm comparison scheme:

The following requisites should be considered while installing a system of inter-firm comparison:

1. Centre for Inter-firm Comparison:

For collection and analysing data received from member units for doing a comparative study and for dissemination of the results of study a Central body is necessary. The functions of such a body may be:

(a) Collection of data and information from its members:

(b) Dissemination of results to its members:

(c) Undertaking research and development for common and individual benefit of its members;

(d) Organising training programmes and publishing magazines.

2. Membership:

Another requirement for the success of inter-firm comparison is that firms of different sizes should become members of the Centre entrusted with the task of carrying out inter-firm comparison.

3. Nature of information to be collected

Although there is no limit to information, yet the following information, useful to the management is in general collected by the center for inter firm comparison.

a. Information regarding costs and cost structures.

b. Raw material consumption

c. Stock of raw material, wastage of materials etc.

d. Labour efficiency and labour utilisation.

e. Machine utilisation and machine efficiency.

f. Capital employed and return on capital

g. Liquidity of the organisation.

h. Reserve and appropriation of profit.

i. Creditors and debtors.

j. Methods of production and technical aspects.

4. Method of Collection and presentation of information:

The centre collects information at fixed intervals in a prescribed form from its members. Sometimes a questionnaire is sent to each member, the replies of the questionnaire received by the Centre constitute the information/data. The information is generally collected at the end of the year as it is mostly related with final accounts and Balance Sheet. The information supplied by firms is generally in the form of ratios and not in absolute figures. The information collected as above is stored and presented to its members in the form of a report. Such reports are not made available to non-members.

Question 2

Write four limitations of inter-firm comparison

(May, 1997, November 2008, 4 marks, 3 marks)

Answer

Limitations of Inter-firm comparison:

The following are the limitations in the implementation of a scheme of inter-firm comparison:

1. Top management feels that secrecy will be lost.
2. Middle management is usually not convinced with the utility of such a comparison.

3. In the absence of a suitable cost accounting system, the figures supplied may not reliable for the purpose of comparison.
4. Suitable basis of comparison may not be available.

Question 3

What are the pre-requisites of an inter firm comparison system?

(May, 2000, Nov.2001, 2004, 4 marks)

Answer

Pre-requisites should be considered while installing a inter-firm comparison system:

1. *Centre for Inter-firm Comparison:* For collection and analysing data received from member units, for doing a comparative study and for dissemination of the results of study a Central body is necessary. The function of such a body may be:
   (a) Collection of data and information from its members.
   (b) Dissemination of results to its members.
   (c) Undertaking research and development for common and individual benefit of its members.
   (d) Organising training programmes and publishing magazines.
2. *Membership:* Another requirement for the success of inter-firm comparison is that the firms of different sizes should become members of the Centre entrusted with the task of carrying out inter-firm comparison.
3. *Nature of information to be collected:* Although there is no limit to information, yet the following information is useful to the management in general. It is collected by the centre for inter-firm comparison.
   a. Information regarding costs and cost structures.
   b. Raw material consumption.
   c. Stock of raw material, wastage of materials, etc.
   d. Labour efficiency and labour utilization.
   e. Machine utilization and machine efficiency.
   f. Capital employed and return on capital.
   g. Liquidity of the organisation.
   h. Reserve and appropriation of profit.
   i. Creditors and debtors.
   j. Methods of production and technical aspects.
4. *Method of collection and presentation of information:* The centre collects information at fixed intervals in a prescribed form from its members. Sometimes a questionnaire is sent

to each member; the replies of the questionnaire received by the centre constitute the information/data. The information is generally collected at the end of the year as it is mostly related with final accounts and balance sheet. The information supplied by firms is generally in the form of ratios and not in absolute figures. The information collected as above is stored and presented to its members in the form of a report. Such reports are not made available to non-members.

Question 4

Write a short note on 'Inter Firm Comparison'. *(May, 1996, 3 marks)*

Answer

Inter-firm comparison: It is a technique of evaluating the performance, efficiency, costs and profits of firms in an industry. It consists of voluntary exchange of information/data concerning costs, prices, profits, productivity and over-all efficiency among firms engaged in similar type of operations for the purpose of bringing improvement in efficiency and indicating the weaknesses. Such a comparison will be possible where uniform costing is in operation.

An inter-firm comparison indicates the efficiency of production and selling, adequacy.

16
Cost Reduction & Cost Control

Question 1

Write short notes on value Analysis (Nov., 1994, 4 marks)

Answer

Value Analysis *:* It is one of the important tools of modern management in the area of cost reduction. It is also known by other names such as value engineering, value control and product research. Value analysis is the process of systematic analysis and evaluation of various techniques and functions with a view to improve organisational performance. It aims at reducing and controlling the cost of a product from the point of view of its value by analysing the value currently received. It investigates into the economic attributes of value analysis, believes in a planned action to improve performance and thereby, generates higher value in a product and ultimately causes reduction in its cost.

The meaning of the term value may vary from person to person, time to time and place to place. However, in the context of cost reduction and control it refers to the 'use value'.

The reduction in the costs of a product and thus increasing the profitability of a concern is the main advantage of value analysis.

The benefits of value analysis are being derived in many industries, e.g., engineering, building construction and the oil industry. It is being applied to components of a product, finished product and also t be methods of packaging.

The various steps involved in value analysis are;

(i) Identification of the problem;

(ii) Collecting information about the function, design, material, labour, overhead costs, etc., of the product and finding out the availability of the competitive products in the market; and

(iii) Exploring and evaluating alternatives and developing them.

Question 2

Distinguish between Cost reduction and Cost control.

(Nov., 2002, May, 2003, 2004, Nov., 2004, 4 marks)

Answer

The points of distinction between Cost reduction and Cost control are as follows:

1.	It aims at achieving a reduction in unit cost of goods manufactured or services rendered without impairing their suitability for the use intended.	It aims at achieving the pre-determined cost targets and ends when the targets are achieved.
2.	It does not recognise any condition as permanent and believe that by waste reduction, expense reduction and increased production cost reduction objective can be achieved.	It entails target setting, ascertaining the actual performance and comparing it with the targets, investigating the variances and taking remedial measures.
3.	It assumes existence of concealed potential savings and challenges the norm.	It does not challenges norms or standards established for the purpose.
4.	It is a corrective function.	It is a preventive function.

Question 3

Distinguish between Cost control and Cost reduction. *(November 2007, 3 Marks)*

Answer

Distinction between Cost Control and Cost Reduction:

Cost control is operated through setting standards of targets and comparing actual performance therewith, with a view to identify deviations from standards or norms and taking corrective action in order to ensure that future performance conforms to standards or norms.

Cost reduction is a continuous process of critical cost examination, analysis and challenge of standards. Each aspect of business viz., products, process, procedures, methods, organization, personnel, etc. is critically examined and reviewed with a view of improving efficiency and effectiveness and reducing the costs.

Cost control lacks the dynamic approach which planned cost reduction demands. In cost reduction, standards which are the basis of control are constantly challenged for improvement.

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SUGGESTED ANSWERS

TO

QUESTIONS

SET AT THE

INSTITUTE'S EXAMINATIONS

MAY, 1981 – NOVEMBER, 2008

A COMPILATION

PROFESSIONAL EDUCATION
(COURSE – II)

PAPER – 4A: COST ACCOUNTING

BOARD OF STUDIES
THE INSTITUTE OF CHARTERED ACCOUNTANTS OF INDIA
NOIDA

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1

BASIC CONCEPTS & PRODUCT COST SHEET

Question 1

SV Ltd. Is a manufacturing company which has a sound system of financial accounting. The management of the company therefore feels that there is no need for the installation of a cost accounting system. Prepare a report to the management bringing out the distinction between cost and financial accounting system and the need for the introduction of a sound cost accounting system.

Answer

The Managing Director,
S.V. Ltd.
New Delhi

Subject : Establishment of a Cost Accounting System

Sir,

During the course of our discussion with you last month, you mentioned that your company did not require a cost accounting system as it had a sound financial accounting system. After our discussion with you, we had an opportunity to study the products, processes of manufacture, organisation and selling and distribution methods of your company-which is a manufacturing company. We have come to the conclusion that your company certainly requires a cost accounting system. To strengthen further our view-point, we give our report by bringing the distinctions between the two systems as below:

The financial accounting system of a company mainly serves as a useful source of information to owner/shareholders/creditors and for tax purposes. It does not provide adequate help to the executives working in the organisation. The information provided by the financial accounting system serves no useful purpose from the view-point of planning, control and decision making. The absence of required information renders planning, control and decision making extremely difficult. On the other hand, cost accounting system was evolved as a supplementary accounting method mainly to serve the needs of management. Cost accounting system can provide at a regular interval, the needed information to the concerned executives to perform the functions of planning, control and decision making.

The financial accounting system shows the trading results of the company as a whole; it does not answer the question why there is an increase or a decrease in profit or loss. The principle of matching costs with revenues under a costing system not only indicates the profit or loss of each product, but would also show the correct value of closing inventory. Thus costing system helps financial accounting system too. Under financial accounting system the financial statements are prepared only at the close of the accounting period. Such statements do not provide day-to-day cost information for evaluating the efficiency of the concern. But cost accounting system can

supply every possible cost information to management for managerial control. Under cost accounting system by using standard costing the variances between predetermined and actual costs can be determined. These variations and their causes speaks about the concern's operating efficiency and inefficiency.

In financial accounting system no attempt is generally made to record data by jobs, processes, products, departments etc. It only provides information in terms of income, expenses, assets and liabilities for the company as a whole. Thus the available information is not very useful for the ascertainment of price, control of costs, ascertainment of product profitability etc. Cost accounting system records data in the manner that helps the ascertainment of price and profitability and also the control of costs by using variances.

Government in its efforts to protect consumers, often resorts to statutory price control. Cost accounting system can help by providing enough cost information which could be utilised to press upon the government to convince for price and to arrive at a suitable price before their arbitrary fixation of it.

It is apparent from the above discussion that detailed and analytical information cannot be had from existing financial accounting system. We therefore strongly recommend the need for the introduction of a sound cost accounting system in your concern.

Yours faithfully,

X . Y.& Co.

Chartered Accountants.

Question 2

(a) Define the terms 'cost centre' and 'cost unit'.

(b) Given below is a list of ten industries. Give the method of costing and the unit of cost against each industry.

(i) Nursing Home

(ii) Road Transport

(iii) Steel

(iv) Coal

(v) Bicycles

(vi) Bridge Construction

(vii) Interior Decoration

(viii) Advertising

(ix) Furniture

(x) Sugar company having its own sugarcane fields.

Answer

(a) Cost Centre

The term cost centre is defined as a location, person or an item of equipment or a group of these for which costs may be ascertained and used for the purposes of cost control. Cost centres can be personal cost centres, impersonal cost centres, operation cost centres and process cost centres.

Cost Unit

The term cost unit is defined as a unit of quantity of product, service or time (or a combination of these) in relation to which costs may be ascertained or expressed. It can be for a job, batch, or product group.

(b)

Industry		*Method of costing*	*Unit of cost*
(i)	Nursing Home	Operating	Per Bed per week or per day
(ii)	Road transport	Operating	Per Tonne Kilometer or per mile
(iii)	Steel	Process	Per Tonne
(iv)	Coal	Single	Per unit
(v)	Bicycles	Multiple	Each unit
(vi)	Bridge construction	Contract	Each contract
(vii)	Interior Decoration	Job	Each Job
(viii)	Advertising	Job	Each Job
(ix)	Furniture	Multiple	Each unit
(x)	Sugar company having its own sugar-cane fields	Process	Per Quintal/Tonne

Question 3

Distinguish between

(i) Cost Unit and Cost Centre

(ii) Cost Centre and Profit Centre

(iii) Bill of material from a material requisition note.

Answer

(i) Distinction between Cost Unit and Cost Centre

The term Cost Unit is defined as a unit of quantity of product, service or time (or a combination of these) in relation to which costs may be ascertained or expressed. It can be for a job, batch, or product group.

The term Cost Centre is defined as a location, person or an item of equipment or a group of these for which costs may be ascertained and used for the purposes of Cost Control. Cost Centres can be personal Cost Centres, impersonal Cost Centres, operation cost and process Cost Centres.

Thus each sub-unit of an organisation is known as a Cost Centre, if cost can be ascertained for it. In order to recover the cost incurred by a Cost Centre, it is necessary to express it as the cost of output. The unit of output in relation to which cost incurred by a Cost Centre is expressed is called a Cost Unit.

(ii) Cost Centre and Profit Centre

A Cost Centre is the smallest segment of activity or the area of responsibility for which costs are accumulated. A Profit Centre is that segment of activity of a business which is responsible for both revenue and expenses and discloses the profit of a particular segment of activity.

Important points of distinction between Cost Centre and Profit Centre are as below:

(a) Cost Centres are created for accounting convenience of costs and their control. Whereas a profit centre is created because of decentralisation of operations.

(b) A Cost Centre does not have target costs but efforts are made to minimise costs, but each profit centre has a profit target and enjoys authority to adopt such policies as are necessary to achieve its targets.

(iii) Bill of Material and Material Requisition Note

Bill of Material: It is a comprehensive list of materials with exact description and specifications, required for a job or other production units. This also provides information about required quantities so that if there is any deviation from the standards, it can easily be detected. It is prepared by the Engineering or Planning Department in a standard form.

Material requisition Note: It is a formal written demand or request, usually from the production department to store for the supply of specified materials, stores etc. It authorises the storekeeper to issue the requisitioned materials and record the same on bin card.

The purpose of bill of material is to act as a single authorisation for the issue of all materials and stores items mentioned in it. It provides an advance intimation to store department about the requirements of materials. It reduces paper work. It serves as a work order to the production department and a document for computing the cost of material for a particular job or work order to the cost department.

The purpose of material requisition note is to draw material from the store by concerned departments.

Question 4

(a) Match the following

(i) Total fixed cost	*1. What cost should be?*

(ii) Total variable cost	*2. Incurred cost*
(iii) Unit variable cost	*3. Increase in proportion to output*
(iv) Unit fixed cost	*4. Cost of conversion*
(v) Standard cost	*5. What costs are expected to be*
(vi) Period cost	*6. Decreases with rise in output*
(vii) Actual cost	*7. Remains constant in total*
(viii) Labour and overhead	*8. Remains constant per unit*
(ix) Incremental cost	*9. Cost not assigned to products*
(x) Budgeted cost	*10. Added value of a new product.*

(b) Indicate whether the following statements are True or False:

(i) All costs are controllable.

(ii) Conversion cost is equal to direct wages plus factory overhead.

(iii) Variable cost per unit varies with the increase or decrease in the volume of output.

(iv) Depreciation is an out of pocket cost.

(v) An item of cost that is direct for one business may be indirect for another

(vi) Fixed cost per unit remains fixed.

Answer

(a) Correct matchings are indicated as below:

(i) ---------- (7)

Total fixed cost, remains constant in total.

(ii) ----------(3)

Total variable cost, increases in proportion to output.

(iii) ----------(8)

Unit variable cost, remains constant per unit.

(iv) ----------(6)

Unit fixed cost, decreases with rise in output.

(v) ----------(1)

Standard cost, what cost should be.

(vi) ----------(9)

Period cost, cost not assigned to products.

(vii)----------(2)

Actual cost, incurred cost.

(viii) ----------(4)

Labour and overhead, cost of conversion.

(ix) ----------(10)

Incremental cost, added value of a new product.

(x) ----------(5)

Budgeted cost, what costs are expected to be.

(b) (i) False

(ii) True

(iii) False

(iv) False

(v) True

(vi) False

Question 5

List down any eight factors that you will consider before installing a costing system.

Answer

The eight factors which must be considered before installing a Costing System are listed below:

(i) *Nature of business:* The system of costing to be introduced should suit the general nature of business.

(ii) *Layout aspects:* The size and layout of the organisation should be studied by the system designers.

(iii) *Methods and procedures in vogue:* The system designers should also study various methods and procedures for the purchase, receipts, storage and issue of material. They should also study the methods of wage payment.

(iv) *Management's expectations and policies:* The system of costing should be designed after a careful analysis of the organisational operations, management's expectation and the policies of the concern.

(v) *Technical aspects:* The technical aspects of the business should be studied thoroughly by the designers. They should also make an attempt to seek the assistance and support of the supervisory staff and workers of the concern for the system.

(vi) *Simplicity of the system:* The system of costing to be installed should be easy to understand and simple to operate. The procedures laid down for operating the system should be easily understood by operating system.

(vii) *Forms standardisation:* Various forms to be used by the costing system for various data/information collection and dissemination should be standardised as far as possible.

(viii) *Accuracy of data:* The degree of accuracy of data to be supplied by the system should be determined.

Question 6

Outline the steps involved in installing a costing system in a manufacturing unit. What are the essentials of an effective costing system?

Answer

The main steps involved in installing a costing system in a manufacturing unit may be outlined as below:

(i) The objectives of installing a costing system in a manufacturing concern and the expectations of the management from such a system should be identified first. The system will be a simple one in the case of a single objective but will be an elaborate one in the case of multiple objectives.

(ii) It is important to ascertain the significant variables of the manufacturing unit which are amenable to control and affect the concern. For example, quite often the production costs control may be more important than control of its marketing cost. Under such a situation, the costing system should devote greater attention to control production costs.

(iii) A thorough study to know about the nature of business, its technical aspects; products, methods and stages of production should also be made. Such a study will facilitate in selecting a proper method of costing for manufacturing unit.

(iv) A study of the organisation structure, its size and layout etc., is also necessary. This is useful to management to determine the scope of responsibilities of various managers.

(v) The costing system should be evolved in consultation with the staff and should be introduced only after meeting their objections and doubts, if any. The co-operation of staff is essential for the successful operation of the system.

(vi) Details of records to be maintained by the costing system should be carefully worked out. The degree of accuracy of the data to be supplied by the system should be determined.

(vii) The forms to be used by foreman, workers, etc., should be standardised. These forms be suitably designed and must ensure minimum clerical work at all stages.

(viii) Necessary arrangements should be made for the flow of information/data to all concerned managers, at different levels, regularly and promptly.

(ix) Reconciliation of costs and financial accounts be carried out regularly, if they are maintained separately.

(x) The costing system to be installed should be easy to understand and simple to operate.

Essential of an effective costing system: The essential features that an effective costing system should possess are as follows:

(a) Costing system should be tailor made, practical, simple and capable of meeting the requirements of a business concern.

(b) The method of costing should be suitable to the industry.

(c) Necessary co-operation and participation of executives from various departments of the concern is essential for developing good cost accounting system.

(d) The cost of installing and operating the system should justify the results.

(e) The system of costing should not sacrifice the utility by introducing meticulous and unnecessary details.

Question 7

Distinguish between the following?

Controllable costs and uncontrollable costs. (May, 1997, 4 marks)

Answer

Controllable costs and uncontrollable costs:

Costs which can be influenced by the action of a specified person in an organisation are known as controllable costs. Costs which remains unaffected by the action of such person are termed as uncontrollable. In a business organisation heads of each responsibility centre are responsible to control costs. Costs which they are able to control are known as controllable and includes material, labour and direct expenses. Costs which they fail to control includes fixed costs and all allocated costs.

It may be noted that controllable and uncontrollable cost concepts are related to the authority of a person in the organisation. An expenditure which may be uncontrollable by one person may be controllable by another. Moreover, in the long run all costs might be controllable.

Question 8

(a) Describe briefly the role of the cost accountant in a manufacturing organisation.

(b) Distinguish between:

(i) Variable cost and direct cost

(ii) Estimated cost and standard cost.

Answer

(a) Cost accountant in a manufacturing organisation plays several important roles. He establishes a Cost Accounting department in his concern. He ascertains the requirement of cost information which may be useful to organisational mangers at different levels of the hierarchy. He develops a manual, which specifies the functions to be performed by the Cost Accounting department. The manual also contains the format of various forms which would be utilised by the concern for procuring and providing information to the concerned officers. It also specifies the frequency at which the cost information would be supplied to a concerned executive.

Usually, the functions performed by a Cost Accounting department includes cost ascertainment, cost comparison, cost reduction, cost control and cost reporting.

Cost ascertainment, requires the classification of costs into direct and indirect. Further it requires classification of indirect costs (known as overheads) into three classes viz, factory overheads; administration overheads and selling and distribution overhead. Cost accountant suggests the basis which may be used by his subordinates for carrying out the necessary classifications as suggested above.

Cost comparison is the task carried out by Cost Accountant for controlling the cost of the products manufactured by the concern. Cost Accountant of the concern establishes standards for all the elements of cost and thus a standard cost of the finished product. The standard cost so determined may be compared with the actual cost to determine the variances. Cost Accountant ascertains the reasons for the occurrence of these variances for taking suitable action.

Cost analysis may also be made by Cost Accountant for taking decisions like make or by and for reviewing the current performance.

Cost Accountant also suggests suitable techniques for the purpose of cost reduction/cost control, after carrying out a cost benefit analysis.

Cost Accountant also plays a key role in the preparation of Cost reports. These reports help the executives of a business concern in reviewing their own performance and in identifying the weak areas, where enough control measure may be taken in future.

In brief, one may say that there is hardly any activity in a manufacturing organisation with which a Cost Accountant is not directly associated in some form or the other.

(b) (i) Variable and direct cost:

A variable cost is a cost that changes in total in direct proportion to changes in the related total activity or volume. Cost of material is an example of variable cost.

Direct cost is a cost which can be identified either with a cost centre or with a cost unit. An example of direct cost is the allocation of direct materials to a department and then to the various jobs. All variable costs are direct-but each direct cost may not be variable.

(ii) Estimated cost and standard cost:

Kohler defines estimated costs as 'the expected cost of manufacture or acquisition, often in terms of a unit of product computed on the basis of information available in advance of actual production or purchase' Estimated cost are prospective costs since they refer to prediction of costs.

Standard Cost means a pre-determined cost. It attempts to show what the cost should be for clearly defined conditions and circumstances. Standard costs represent' planned cost of a product. They are expected to be achieved under a particular production process under normal conditions.'

Although pre-determination is the essence of both standard costs and estimated costs, but they differ from each other in the following respects:

(i) Difference in computation

(ii) Difference in emphasis

(iii) Difference in use

(iv) Difference in records

(v) Applicability

Question 9

Enumerate the main objectives of introduction of a Cost Accounting System in a manufacturing organisation.
(Nov, 2002, 3 marks)

Answer

The main objectives of introduction of a Cost Accounting System in a manufacturing organization are as follows:

(i) Ascertainment of cost

(ii) Determination of selling price

(iii) Cost control and cost reduction

(iv) Ascertainment of profit of each activity

(v) Assisting in managerial decision making

Question 10

Write short notes on any two of the following?

(i) Conversion cost (ii) Sunk cost (iii) Opportunity cost *(May, 2003, 4 marks*)

Answer

(i) Conversion cost:

It is the cost incurred to convert raw materials into finished goods. It is the sum of direct wages, direct expenses and manufacturing overheads.

(ii) Sunk cost:

Historical costs or the costs incurred in the past are known as sunk cost. They play no role in the current decision making process and are termed as irrelevant costs. For example, in the case of a decision relating to the replacement of a machine, the written down value of the existing machine is a sunk cost, and therefore, not considered.

(iii) Opportunity cost:

It refers to the value of sacrifice made or benefit of opportunity foregone in accepting an alternative course of action. For example, a firm financing its expansion plan by withdrawing money from its bank deposits. In such a case the loss of interest on the bank deposit is the opportunity cost for carrying out the expansion plan.

Question 11

Write short notes on Cost Centre *(May 1995, 4 marks)*

Answer

Cost Centre : It is defined as a location, person or an item of equipment or a group of these for which costs are ascertained and used for cost control. Cost centres are of two types viz, impersonal and personal.

A cost centre which consists of a location or an item of equipment or a group of these is called an impersonal cost centre. A cost centre which consists of a person or a group of person is known as a personal cost centre.

In a manufacturing concern there are two type of cost centres viz., production and service. Production cost centres are those where production activity is actually carried out whereas service cost centres are those sections which are ancillary and render service to production cost centres.

Question 12

Name the various reports (Elaboration not needed) that may be provided by the Cost Accounting Department of a big manufacturing company for the use of its executives.

(May, 1998, 5 marks)

Answer

Various reports that may be provided by the Cost Accounting Department of a big manufacturing Company for the use of its executives are as under:

(i) Cost Sheets

(ii) Statements of material consumption

(iii) Statements of labour utilisation

(iv) Overheads incurred compared with budgets

(v) Sales effected compared with budgets

(vi) Reconciliation of actual profit with estimated profit

(vii) The total cost of inventory carried

(viii) The total cost of abnormally spoiled work in factory and abnormal losses in stores

(ix) Labour turnover statements

(x) Expenses incurred on research and development compared with budgeted amounts.

Question 13

State the unit of cost and method of costing generally used for accounting purpose in the following cases:

(i) Brick-works *(ii) Bi-cycle*

(iii) Oil refining mill and *(iv) Road transport company*

(Nov, 1997, 2 marks)

Answer

Industry/Product		*Unit of cost*	*Method of Costing*
(i)	Brick – works	1,000 bricks	Single or output
(ii)	Bi-cycle	Each bicycle	Multiple
(iii)	Oil refining mill	Per-Tonne	Process

(iv) Road transport company Per-tonne-km Operating

Question 14

What is meant by Profit Centre?
(Nov,1997, 4 marks)

Answer

Profit Centre: It is defined as an activity centre of a business organisation. Chief of such a centre is fully responsible for all costs, revenues and profitability of its operation. The main objective of profit centre is to maximise the centre's profit. Creation of profit centres facilitates management control and implementation of the objectives of responsibility accounting. A profit centre may have a number of cost centres.

Question 15

What is meant by cost centre? (May, 1997, Nov.,2002, 4 marks)

Answer

Cost Centre

It is the smallest area of responsibility or segment of activity for which costs are accumulated. It can be defined as a location; person or an item of equipment or a group of these for which costs are ascertained and used for the purpose of cost control. Cost centres are of two types viz.., personal and impersonal.

Personal cost centre: It is a cost centre which consists of a person or a group of persons.

Impersonal cost centre: It is a cost centre which consists of a location or an item of equipment or a group of these.

In a manufacturing concern there are two types of cost centres viz., production and service cost centres.

Question 16

How does a production account differ from a cost sheet (May, 2000, 3 marks)

Answer

The following are the points of difference between a production account and a cost sheet.

(i) Production Account is based on double entry system whereas cost sheet is not based on double entry system.

(ii) Production Account consists of two parts. The first part shows cost of the component and total production cost. The second part shows the cost of sales and profit for the period. Cost Sheet presents the elements of costs in a classified manner and the cost ascertained at different states such as prime cost; works cost; cost of production; cost of goods sold; cost of sales and total cost.

(iii) Production Account shows the cost in aggregate and thus facilitates comparison with other financial accounts. Cost sheet shows the cost in a detailed and analytical manner which facilitates comparison of cost for the purpose of cost control.

(iv) Production Account is not useful for preparing tenders or quotations. Estimated cost sheets can be prepared on the basis of actual cost sheets and these are useful for preparing tenders or quotations.

Question 17

Discuss cost classification based on variability and controllability. (Nov, 2004, 4 marks)

Answer

Cost classification based on variability

Fixed cost – These are costs, which do not change in total despite changes of a cost driver. A fixed cost is fixed only in relation to a given relevant range of the cost driver and a given time span. Rent, insurance, depreciation of factory building and equipment are examples of fixed costs where the final product produced is the cost object.

Variable costs – These are costs which change in total in proportion to changes of cost driver. Direct material, direct labour are examples of variable costs, in cases where the final product produced is the cost object.

Semi-variable costs – These are partly fixed and partly variable in relation to output e.g. telephone and electricity bill.

Cost classification based on controllability

Controllable costs – Are incurred in a particular responsibility center and relate to a defined time span. They can be influenced by the action of the executive heading the responsibility center e.g. direct costs.

Uncontrollable costs – Are costs are influenced by the action of the responsibility center manager e.g. expenditure incurred by the tool room are controllable by the foreman in charge of that section, but the share of tool room expenditure which are apportioned to the machine shop are not controllable by machine shop foreman.

Question 18

Discuss the essential of a good cost accounting system? (May, 2004, 2 marks)

Answer

Essentials of a good cost accounting system:

- It should be tailor-made, practical, simple and capable of meeting the requirements of a business concern.
- The data used by the system should be accurate, otherwise it may distort the output of system.
- Cost of installing & operating the system should justify the results.
- Cost accounting system should have the support of top management of the concern.
- The system should have the necessary support from all the user's departments.

Question 19

Explain:

(i) Sunk Costs

(ii) Pre-production Costs

(iii) Research and Development Costs

(iv) Training Costs
(Nov, 2000, 2 x 4 = 8 marks)

Answer

(i) *Sunk Costs:* These are historical costs which are incurred in the past. These costs were incurred for a decision made in the past and cannot be changed by any decision that will be made in future. In other words, these costs plays no role in decision making, in the current period. While considering the replacement of a plant, the depreciated book value of the old plant is irrelevant, as the amount is a sunk cost which is to be written off at the time of replacement.

(ii) *Pre-production Costs:* These costs forms the part of development cost, incurred in making a trial production run, preliminary to formal production. These costs are incurred when a new factory is in the process of establishment or a new project is undertaken or a new product line or product is taken up, but there is no established or formal production to which such costs may be charged. These costs are normally treated as deferred revenue expenditure (except the portion which has been capitalised) and charged to the costs of future production.

(iii) *Research and Development Costs:* Research costs are the costs incurred for the discovery of new ideas or processes by experiment or otherwise and for using the results of such experimentation on a commercial basis. Research costs are defined as the costs of searching for new or improved products, new applications of materials, or improved methods, processes, systems or services.

Development costs, are the costs of the process which begins with the implementation of the decision to produce a new or improved product or to employ a new or improved method and ends with the commencement of formal production of that product by that method.

(iv) *Training Costs:* These costs comprises of – wages and salaries of the trainees or learners, pay and allowances of the training and teaching staff, payment of fees etc, for training or for attending courses of studies sponsored by outside agencies and cost of materials, tools and equipments used for training. Costs incurred for running the training department, the losses arising due to the initial lower production, extra spoilage etc. occuring while providing training facilities to the new recruits.

All these costs are booked under separate standing order numbers for the various functions. Usually there is a service cost centre, known as the Training Section, to which all the training costs are allocated. The total cost of training section is thereafter apportioned to production centers.

Question 20

Enumerate the factors which are to be considered before installing a system of cost accounting in a manufacturing organization.
(Nov, 1999, 5 marks)

Answer

Factors which are to be considered before installing a system of cost accounting in a manufacturing organization are:

(i) The objectives of installing a system of cost accounting should be defined, that is whether the system is meant for control of cost or for price fixation

(ii) The organization of the company should be studied to understand the authority and responsibilities of the managers.

(iii) The technical aspects and flow process should be taken into consideration.

(iv) The products to be manufactured should be studied.

(v) The marketing set up to be looked into for devising suitable control reports.

(vi) The possibility of integrating cost accounting system with financial accounting system should be examined.

(vii) The procedure for collection and verification of reliability of the information should be studied.

(viii) The degree of details of information required at each level of management should be examined.

(ix) The maximum amount of information that would be sufficient and how the same should be secured without too much clerical labour, especially the possibility of collection of data on a separate printed form designed for each process; also the possibility of instruction as regards filling up of the forms in writing to ensure that these would be faithfully carried out.

(x) How the accuracy of the data collected can be verified? Who should be made responsible for making such verification with regard to each operation and the form of certification that should be given indicate verification that he has carried out.

(xi) The manner in which the benefits of introducing Cost Accounting could be explained to various persons in the concern, specially those incharge of production department and an awareness created for the necessity of promptitude, frequency and regularity in collection of costing data.

Question 21

You have been asked to install a costing system in a manufacturing company. What practical difficulties will you expect and how will you propose to overcome the same?

(May, 2004, 4 marks)

Answer

The practical difficulties with which a Cost Accountant is usually confronted with while installing a costing system in a manufacturing company are as follows:

(i) *Lack of top management support:* Installation of a costing system do not receive the support of top management. They consider it as an interference in their work. They believe that such, a system will involve additional paperwork. They also have a misconcept in their minds that the system is meant for keeping a check on their activities.

(ii) *Resistance from cost accounting departmental staff:* The staff resists because of fear of loosing their jobs and importance after the implementation of the new system.

(iii) *Non cooperation from user departments:* The foremen, supervisor and other staff members may not cooperate in providing requisite data, as this would not only add to their responsibilities but will also increase paper work of the entire team as well.

(iv) *Shortage of trained staff:* Since cost accounting system's installation involves specialised work, there may be a shortage of trained staff.

To overcome these practical difficulties, necessary steps required are:

- To sell the idea to top management – To convince them of the utility of the system.
- Resistance and non cooperation can be overcome by behavioral approach. To deal with the staff concerned effectively.
- Proper training should be given to the staff at each level
- Regular meetings should be held with the cost accounting staff, user departments, staff and top management to clarify their doubts / misgivings.

Question 22

Distinguish between controllable & uncontrollable costs? (Nov, 2001, 2 marks)

Answer

Controllable costs and Uncontrollable costs:

Controllable costs are the costs which can be influenced by the action of a specified member of the undertaking. Controllable costs incurred in a particular responsibility centre can be influenced by the action of the executive heading that responsibility centre.

Uncontrollable costs are the costs which cannot be influenced by the action of a specified member of an undertaking.

Question 23

Define Explicit costs. How is it different from implicit costs? (May, 2001, 2 marks)

Answer

Explicit costs: These costs are also known as out of pocket costs. They refer to those costs which involves immediate payment of cash. Salaries, wages, postage and telegram, interest on loan etc. are some examples of explicit costs because they involve immediate cash payment. These payments are recorded in the books of account and can be easily measured.

Main points of difference: The following are the main points of difference between explicit and implicit costs.

(i) Implicit costs do not involve any immediate cash payment. As such they are also known as imputed costs or economic costs.

(ii) Implicit costs are not recorded in the books of account but yet, they are important for certain types of managerial decisions such as equipment replacement and relative profitability of two alternative courses of action.

Question 24

(a) What are the essentials of a Cost Accounting System? (May, 1996, (6 marks)

(b) *Narrate the essential factors to be considered while designing and installing a Cost Accounting System.*
(May, 1996, 10 marks)

Answer

(a) Essentials of a Good Cost Accounting System

The essential features of a good Cost Accounting system are as follows:

(i) The Cost Accounting System should be tailor made, practical, simple and capable of meeting the requirements of a business concern.

(ii) The method of costing should be suitable to the industry and serve its objectives.

(iii) The Costing System should receive co-operation and participation of executives from various departments.

(iv) The cost of installing and operating the system should justify the results.

(v) The system of costing should not sacrifice the utility by introducing meticulous and unnecessary details.

(vi) The system should consider the organisational structure of the business and it should be designed as a sub-system of the overall organisation.

(vii) There should be a harmonious relationship between costing and financial accounts departments. Unnecessary duplication should be avoided. A single integrated accounting system may be designed.

(viii) The system should provide adequate checks on ordering, receipts, stocking, issuing and recording of materials. The pricing method and the issue of materials should be efficient.

(ix) The costing system should ensure proper recording of worker's time and their wages. Wages should be determined from wage analysis sheets. Proper attention should be paid in preparing payrolls and in the payment of wages. The treatment of idle time, over-time and holiday-pay should not be overlooked.

(x) The cost accounting system should ensure that overheads are collected, accumulated, allocated and apportioned suitably.

(b) Essential factors for designing a cost accounting system

The essential factors to be considered while designing a Cost Accounting System are as follows:

(i) A thorough understanding of – Organisational structure; manufacturing procedure, and process; selling and distribution procedure; and type of cost information required.

(ii) Selection of a suitable costing technique (Standard or actual, marginal or absorption)

(iii) Pricing method suitable, for the material, to be issued to production.

(iv) Method suitable for booking labour cost on jobs.

(v) A sound plan should be devised for the collection, allocation, apportionment and absorption of overheads.

(vi) Deciding on ways of treating waste, scrap and idle time.

(vii) Designing of suitable forms to be used for collecting and dissemination of Cost data/information.

(viii) Introduction of budgetary control technique so that actual performance may be compared with budgetary figures, for measuring efficiency or performance.

Essential factors for installing a Cost Accounting System.

The essential factors for installing a Cost Accounting System are listed as below:

(i) The objectives of installing a Costing System and the expectations of the management from the system should be identified first. The system will be a simple one in the case of a single objective but will be an elaborate one in the case of multiple objectives.

(ii) It is important to ascertain the significant variables of the manufacturing unit which are amenable to control and affect the concern. For example, quite often the production costs control may be more important than control of its marketing cost. Under such a situation, the costing system should devote greater attention to control production cost.

(iii) A thorough study of the nature of business, its technical aspects, products, methods and stages of production should be made. This will help in selecting a proper method of costing.

(iv) A Study of the organisation structure, its size and layout etc., is also necessary. This is useful to management to determine the scope of responsibilities of various managers.

(v) The costing system should be evolved in consultation with the staff and should be introduced only after meeting their objections and doubts, if any. The co-operation of staff is essential for the successful operation of the system.

(vi) Details of the records to be maintained by the costing system should be carefully worked out. The degree of accuracy of the data to be supplied by the system should be determined.

(vii) The forms to be used by foreman, workers etc., should be standardised. These forms be suitably designed and must ensure minimum clerical work at all stages.

(viii) Necessary arrangements should be made for the flow of information/data to all concerned managers, at different levels, regularly and promptly.

(ix) Reconciliation of costs and financial accounts be carried out regularly, if they are maintained separately.

(x) The costing system to be installed should be easy to understand and simple to operate.

Question 25

What are the main objectives of Cost Accounting? (May, 2001, 2 marks)

Answer

The main objectives of Cost Accounting are as follows:

(i) Ascertainment of cost.

(ii) Determination of selling price.

(iii) Cost control and cost reduction.

(iv) Ascertainment of profit of each activity.

(v) Assisting management in decision making.

Question 26

Explain controllable and non-controllable costs with illustrations. (May, 2001,2 marks)

Answer

Controllable and non-Controllable costs

Controllable costs: These are the costs which can be influenced by the action of a specified person in an organisation. In every organisation, there are a number of departments which are called responsibility centres, each under the charge of a specified level of management. Costs incurred in these responsibility centres are influenced by he action of the incharge of the responsibility centre. Thus any cost that an organisational unit has the authority to incur may be identified as controllable cost.

Non-controllable costs: These are the costs which cannot be influenced by the action of a specified member of an undertaking. For example, expenditure incurred by the 'Tool Room' is controllable by the Tool Room Manager but the share of Tool Room expenditure, which is apportioned to the Machine Shop cannot be controlled by the manager of the Machine Shop.

However, the distinction between controllable and non-controllable costs is not very sharp and is sometimes left to individual judgment to specify a cost as controllable or non-controllable in relation to a particular individual manager.

Question 27

Discuss the four different methods of costing alongwith their applicability to concerned industry?

(Nov, 1999, 4 marks)

Answer

Four different methods of costing along with their applicability to concerned industry have been discussed as below:

1. *Job Costing:* The objective under this method of costing is to ascertain the cost of each job order. A job card is prepared for each job to accumulate costs. The cost of the job is determined by adding all costs against the job it is incurred. This method of costing is used in printing press, foundries and general engineering workshops, advertising etc.

2. *Batch Costing:* This system of costing is used where small components/parts of the same kind are required to be manufactured in large quantities. Here batch of similar products is

   treated as a job and cost of such a job is ascertained as discussed under 1, above. If in a cycle manufacturing unit, rims are produced in batches of 2,500 units each, then the cost will be determined in relation to a batch of 2,500 units.

3. *Contract Costing:* If a job is very big and takes a long time for its completion, then method used for costing is known as Contract Costing. Here the cost of each contract is ascertained separately. It is suitable for firms engaged in the construction of bridges, roads, buildings etc.

4. *Operating Costing:* The method of Costing used in service rendering undertakings is known as operating costing. This method of costing is used in undertakings like transport, supply of water, telephone services, hospitals, nursing homes etc.

Question 28

Distinguish between:

Marginal Costing and Differential Costing

Answer

Marginal Costing and Differential Costing

Marginal Costing is defined as the 'Ascertainment of marginal costs and of the effect on profit of changes in volume or type of output by differentiating between fixed costs and variable costs'.

Differential Costing is defined as the technique of costing which uses differential costs and/or differential revenues for ascertaining the acceptability of an alternative. The technique may be termed as incremental costing when the difference is increase in costs and decremental costing when the difference is decrease in costs. The main points of distinction between marginal costing and differential costing are as below:

(a) The technique of marginal costing requires a clear distinction between variable costs and fixed costs whereas no such distinction is made in the case of differential costing.

(b) In marginal costing, margin of contribution and contribution ratio are the main yard sticks for performance evaluation and for decision making whereas under differential costs analysis, differential costs are compared with the incremental or decremental revenue (as the case may be) for arriving at a decision.

(c) Differential cost analysis is possible in both absorption costing and marginal costing, where as marginal costing in itself is a distinct technique.

(d) Marginal cost may be incorporated in the cost accounting system whereas differential costs are worked out separately.

Question 29

Specify the methods of costing and cost units applicable to the following industries:

(i) *Toy making*

(ii) *Cement*

(iii) *Radio*

(iv) *Bicycle*

(v) *Ship building*

(vi) *Hospital*

(Nov, 1998, 3 marks)

Answer

Industry	*Method of costing*	*Unit of cost*
(i) Toy making	Batch	Per batch
(ii) Cement	Unit	Per tonne or per bag
(iii) Radio	Multiple	Per Radio or per batch
(iv) Bicycle	Multiple	Per Bicycle
(v) Ship building	Contract	Per Ship
(vi) Hospital	Operating	Per Bed per day or Per patient per day

Question 30

How does a Production Account differ from a Cost Sheet (Nov, 1998, 3 marks)

Answer

The following are the points of difference between a Production Account and a Cost Sheet.

(i) Production Account is based on double entry system whereas cost sheet is not based on double entry system.

(ii) Production Account consists of two parts. The first part shows cost of the components and total production cost. The second part shows the cost of sales and profit for the period. Cost sheet presents the elements of costs in a classified manner and the cost is ascertained at different stages such as prime cost; works cost of production; cost of goods sold; cost of sales and total cost.

(iii) Production account shows the cost in aggregate and thus facilitates comparison with other financial accounts. Cost sheet shows the cost in detail and analytical manner which facilitates comparison of cost for the purpose of cost control.

(iv) Production accounts is not useful for preparing tenders or quotations. Estimated cost sheets can be prepared on the basis of actual costs sheets and these are useful for preparing tenders or quotations.

Question 31

A factory uses a job costing system. The following cost data are available from the books for the year ended 31st March, 1989:

	Rs.
Direct Material	*9,00,000*
Direct Wages	*7,50,000*
Profit	*6,09,000*
Selling and Distribution Overhead	*5,25,000*
Administrative Overhead	*4,20,000*
Factory Overhead	*4,50,000*

Required

(a) Prepare a Cost Sheet indicating the prime cost, works cost, production cost, cost of sales and sales value.

(b) In 1989-90, the factory has received an order for a number of jobs. It is estimated that the direct materials is would be Rs. 12,00,000 and direct labour would cost Rs. 7,50,000. What would be the price for these jobs if the factory intends to earn the same rate of profit on sales, assuming that the selling and distribution overhead has gone up by 15%. The factory recovers factory overhead as a percentage of direct wages and administrative and selling and distribution overheads as a percentage of works cost, based on the cost rates prevalent in the previous year.

Answer

(a) COST SHEET

For the jobs carried out by the concern for the year ending on 31st March, '89

	Rs.
Direct Material	9,00,000
Direct Wages	7,50,000
PRIME COST	16,50,000
Factory Overhead	4,50,000
WORKS COST	21,00,000
Administrative Overhead	4,20,000
PRODUCTION COST	25,20,000
Selling and Distribution Overhead	5,25,000

COST OF SALES	30,45,000
Profit	6,09,000
SALES VALUE	36,54,000

(b) **COST SHEET**

For the Jobs carried out during the year 1989-90

	Rs.
Direct Material	12,00,000
Direct Labour	7,50,000
PRIME COST	19,50,000
Factory Overhead	4,50,000
(Refer to Working Note-1)	
WORKS COST	24,00,000
Administrative Overhead	4,80,000
(Refer to Working Note-2)	
PRODUCTION COST [1]	28,80,000
Selling and Distribution Overhead	6,90,000
(Refer to Working Note-3)	
COSTS OF SALES	35,70,000
Profit	7,14,000
(Refer to Working Note-4)	
SALES VALUE	42,84,000

Working Notes

1. **Factory Overhead** = Percentage of direct wages

(to be charged during 1989-90)

$$= \frac{\text{Factory overhead of } 1988-89}{\text{Direct wages}} \times 100$$

$$= \frac{\text{Rs.}4,50,000}{\text{Rs.}7,50,000} \times 100$$

= 60% of Direct Wages of 1989-90.

[1] *Production Cost here is a misnomer, infact Works Cost itself is the Production Cost.*

= 60% of Rs. 7,50,000

= Rs. 4,50,000.

2. **Administrative Overhead** = Percentage of Works Cost
(to be charged during 1989-90)

$$= \frac{\text{Administrative overhead of } 1988-89}{\text{Works cost of } 1988-89}$$

$$= \frac{\text{Rs. } 4,20,000}{\text{Rs. } 21,00,000} \text{ x } 100$$

= 20% of works cost of 1989-90

= 20% of Rs. 24,00,000

= Rs. 4,80,000

3. **Selling and Distribution Overhead** = Percentage of Works Cost
(to be charged during 1989-90)

$$\text{Selling and Distribution} = \frac{\text{Overhead of } 1988-89}{\text{Works cost of } 1988-89} \text{ x } 100$$

$$= \frac{\text{Rs. } 5,25,000}{\text{Rs. } 21,00,000} \text{ x } 100$$

= 25% of Works Cost of 1989-90

= 25% of Rs. 24,00,000

= Rs. 6,00,000

Total Selling and Distribution Overhead including 15% increase =Rs. 6,00,000+15% of Rs. 6,00,000 = Rs. 6,90,000.

4. **Profit (for 1989-90)**
At the rate of profit of 1988-89

$$= \frac{\text{Profit}}{\text{Sales value}} \text{ x } 100$$

$$= \frac{\text{Rs. } 6,09,000}{\text{Rs. } 36,54,000} \text{ x } 100$$

Rs. 36,54,000

= 16.67% of Sales Value

= 20% of Cost of Sales

= 20% of Rs. 35,70,000 = Rs. 7,14,000

Question 32

The books of Adarsh Manufacturing Company present the following data for the month of April, 1992.

Direct labour cost Rs. 17,500 being 175% of works overheads.

Cost of goods sold excluding administrative expenses Rs. 56,000.

Inventory accounts showed the following opening and closing balance:

	April 1	*April 30*
	Rs.	*Rs.*
Raw materials	*8,000*	*10,600*
Works in progress	*10,500*	*14,500*
Finished goods	*17,600*	*19,000*

Other data are :	*Rs.*
Selling expenses	*3,500*
General and administration expenses	*2,500*
Sales for the month	*75,000*

You are required to

(i) Compute the value of materials purchased

(ii) Prepare a cost statement showing the various elements of cost and also the profit earned.

Answer

(i) Computation of the value of materials purchased

	Rs.
Cost of goods sold	56,000
Add: Closing stock of finished goods	19,000
	75,000
Less: Opening stock of finished goods	17,600
Cost of goods manufactured	57,400
Add: Closing stock of works-in-progress	14,500
	71,900
Less: Opening stock of work-in-progress	10,500

Works Cost	61,400
Less: Factory Overhead: $\left(\frac{100}{175}\text{ of Direct Labour Cost}\right)$	10,000
Prime Cost	51,400
Less: Direct Labour	17,500
Raw materials consumed	33,900
Add: Closing stock of raw materials	10,600
Raw materials available	44,500
Less: Opening stock of raw materials	8,000
Value of materials purchased	36,500

(ii) Cost Statement Showing the various elements of Cost and Profit Earned

	Rs.
Raw material consumed	33,900
(Refer to Statement (I) above)	
Direct labour cost	17,500
Prime Cost	51,400
Add: Factory Overheads	10,000
Works Cost	61,400
Add: Opening Work-in-progress	10,500
	71,900
Less: Closing Work-in-progress	14,500
Cost of goods manufactured	57,400
Add: Opening stock-of finished goods	17,600
	75,000
Less: Closing stock of finished goods	19,000
Cost of Goods Sold	56,000
Add: General and administration expenses	2,500
Add: Selling expenses	3,500
Cost of Sales	62,000
Profit (Balance figure Rs. 75,000 – Rs. 62,000)	13,000
Sales	75,000

Question 33

Popeye Company is a metal and wood cutting manufacture, selling products to the home construction market. Consider the following data for the month of October, 2004.

	Rs.
Sandpaper	*5,000*
Material-handling costs	*1,75,000*
Lubricants and Coolants	*12,500*
Miscellaneous indirect manufacturing labour	*1,00,000*
Direct manufacturing labour	*7,50,000*
Direct materials, October 1, 2004	*1,00,000*
Direct materials, October 31, 2004	*1,25,000*
Finished goods, October 1, 2004	*2,50,000*
Finished goods, October 31, 2004	*3,75,000*
Work –in-process, October 1, 2004	*25,000*
Work-in-process, October 31, 2004	*35,000*
Plant-leasing costs	*1,35,000*
Depreciation-plant equipment	*90,000*
Property taxes on plant equipment	*10,000*
Fire insurance on plant equipment	*7,500*
Direct materials purchased	*11,50,000*
Sales revenues	*34,00,000*
Marketing promotions	*1,50,000*
Marketing salaries	*2,50,000*
Distribution costs	*1,75,000*
Customer-service costs	*2,50,000*

Required

(i) Prepare an income statement with a separate supporting schedule of cost of goods manufactured.

(ii) For all manufacturing items, indicate by V or F whether each is basically a variable cost or a fixed cost (where the cost object is a product unit). (Nov, 2004, 6+2=8 marks)

Answer

(i) Popeye company 'Schedule for cost of goods manufactured' for the month ending Oct 2004

	Rs.	Rs.
Direct materials		
Beginning Inventory	1,00,000	
Purchase of Direct Materials	11,50,000	

Cost of direct materials available for use	12,50,000	
Ending inventory	1,25,000	
Direct materials used		11,25,000(V)
Direct manufacturing labour		7,50,000(V)
Indirect manufacturing costs		
Sand Paper	5,000(V)	
Material-handling cost	1,75,000(V)	
Lubricants and coolants	12,500(V)	
Misc. indirect mfg labour	1,00,000(V)	
Plant leasing cost	1,35,000(F)	
Depreciation-plant & equipment	90,000 (F)	
Property tax-plant & equipment	10,000 (F)	
Fire insurance-plant & equipment	7,500 (F)	5,35,000
Manufacturing cost incurred during the month of October, 2004		24,10,000
Add: Op. work-in-progress		25,000
		24,35,000
Less: Cl. Work-in-progress		35,000
Cost of goods manufactured (to income statement)		24,00,000

(ii) Popeye Company : Income Statement for the month ending Oct 31,2004

	Rs.	*Rs.*
Revenues		34,00,000
Cost of goods sold:		
Beginning finished goods	2,50,000	
Cost of goods manufactured	24,00,000	
Cost of goods available for sale	26,50,000	
Ending finished goods	3,75,000	22,75,000
Gross Margin		11,25,000
Marketing, Distribution and Customer Service Costs:		
Marketing promotions	1,50,000	
Marketing salaries	2,50,000	
Distribution costs	1,75,000	
Customer service cost	2,50,000	8,25,000

Operating Income	3,00,000

Question 34

A fire occurred in the factory premises on October 31, 2003. The accounting records have been destroyed. Certain accounting records were kept in another building. They reveal the following for the period September 1, 2003 to October 31, 2003.

(i) Direct materials purchased	*Rs. 2,50,000*
(ii) Work in process inventory, 1.9.2003	*Rs. 40,000*
(iii) Direct materials inventory, 1.9.2003	*Rs. 20,000*
(iv) Finished goods inventory, 1.9.2003	*Rs. 37,750*
(v) Indirect manufacturing costs	*40% of conversion cost*
(vi) Sales revenues	*Rs. 7,50,000*
(vii) Direct manufacturing labour	*Rs. 2,22,250*
(viii) Prime costs	*Rs. 3,97,750*
(ix) Gross margin percentage based on revenues	*30%*
(x) Cost of Goods available for sale	*Rs. 5,55,775*

The loss is fully covered by insurance company. The insurance company wants to know the historical cost of the inventories as a basis for negotiating a settlement, although the settlement is actually to be based on replacement cost, not historical cost.

Required

(i) Finished goods inventory, 31,10,2003

(ii) Work-in-process inventory, 31.10.2003

(iii) Direct materials inventory, 31.10.2003 *(November, 2003, 3+3+2 = 8 marks)*

Answer

Working notes

1. *Direct material inventory cost (used during the month):*

   = Prime cost – Direct manufacturing labour cost

   = Rs. 3,97,750 – Rs. 2,22,250 = Rs. 1,75,500

2. *Conversion and indirect manufacturing cost:*

Conversion cost	= (Direct manufacturing cost + Indirect manufacturing cost)
But Indirect manufacturing cost	= 40% of conversion cost
Or Conversion cost	= Direct manufacturing cost + 40% of conversion cost

Or 0.60 conversion cost = Direct manufacturing cost

Or Conversion cost $= \frac{\text{Direct manufacturing cost}}{0.60}$

$= \frac{\text{Rs. 2,22,250}}{0.60}$

= Rs. 3,70,417

Or Indirect manufacturing cost = 40% x Rs. 3,70,417

= Rs. 1,48,167

3. Cost of goods manufactured

	Rs.
Cost of goods available for sale	5,55,775
Less: Finished goods 1.9.2003	37,750
Cost of goods manufactured	5,18,025

(i) Finished goods inventory, 31.10.2003

	Rs.
Sales revenue	7,50,000
Less: Gross margin	2,25,000
(30% of revenue)	
Cost of goods sold: (a)	5,25,000
Cost of goods available for sale: (b)	5,55,775
Finished goods inventory, 31.10.2003: {(b)– (a)}	30,775

(ii) Work-in-process inventory, 31.10.2003:

	Rs.
Prime cost	3,97,750
Add: Indirect manufacturing cost	1,48,167
(Refer to working note 2)	
Add: Opening work-in-process, 1.9.2003	40,000
Manufacturing cost to account for	5,85,917
Less: Cost of goods manufactured	5,18,025
Work-in-process inventory, 31.10.2003	67,892

(iii) Direct material inventory, 31.10.2003

	Rs.
Direct materials inventory, 1.9.2003	20,000
Add: Direct materials purchased	2,50,000
	2,70,000
Less: Direct material inventory (used during the month)	1,75,500
(Refer to working note 1)	
Direct material inventory, 31.10.2003	94,500

Question 35

A Company manufactures radios, which are sold at Rs. 1,600 per unit. The total cost is composed of 30% for direct materials, 40% for direct wages and 30% for overheads. An increase in material price by 30% and in wage rates by 10% is expected in the forthcoming year, as a result of which the profit at current selling price may decrease by 40% of the present profit per unit. You are required to prepare a statement showing current and future profit at present selling price.

How much Selling Price should be increased to maintain the present rate of profit?

(May, 2001, 4 marks)

Answer

Let X be the cost, Y be the profit and Rs. 1,600 selling price per unit of radio manufactured by a company. Hence

X + Y = 1,600 ------- (I)

Statement of present and future Cost of a radio

Particulars	*Present cost* *Rs.*	*Increase in cost (Rs.)*	*Anticipated future cost (Rs.)*
	(a)	*(b)*	*(c) = (a) + (b)*
Direct material	0.3 X	0.09 X	0.39 X
Direct labour	0.4 X	0.04 X	0.44 X
Overheads	0.3 X	--	0.30 X
Total	X	0.13 X	1.13 X

An increase in material price and wage rates resulted into a decrease in current profit by 40 percent at present selling price; therefore we have:

1.13 X + 0.6 Y = 1,600 ----------(ii)

On solving (I) and (ii) we get:

X = Rs. 1,207.55

Y = Rs. 392.45

Current profit Rs. 392.45 or 32.5% of cost

Future profit Rs. 235.47

Statement of revised selling price to maintain the present rate of profit

	Rs.
Direct material cost	470.94
(0.39 x Rs. 1,207.55)	
Direct labour cost	531.32
(0.44 x Rs. 1207.55)	
Overheads	362.27
(0.30 x Rs. 1.207.55)	
Total cost	1,364.53
Profit	443.47
(32.5% of total cost)	
Revised selling price	1,808.00

Question 36

In an engineering company, the factory overheads are recovered on a fixed percentage basis on direct wages and the administration overheads are absorbed on a fixed percentage basis on factory cost.

The company has furnished the following data relating to two jobs undertaken by it in a period:

	Job 101	*Job 102*
	Rs.	*Rs.*
Direct Materials	*54,000*	*37,500*
Direct Wages	*42,000*	*30,000*
Selling Price	*1,66,650*	*1,28,250*
Profit Percentage on total cost	*10%*	*20%*

Required:

(i) Computation of percentage recovery rates of factory overheads and administrative overheads.

(ii) Calculation of the amount of factory overheads, administrative overheads and profit for each of the two jobs.

(iii) Using the above recovery rates fix the selling price of job 103. The additional data being.

Direct Materials	*Rs. 24,000*
Direct Wages	*Rs. 20,000*
Profit Percentage on Selling Price	*12-1/2%*

(May, 1995, 16 marks)

Answer

(i) Let factory overhead recovery rate, as percentage of direct wages be F and administrative overheads recovery rate, as percentage of factory cost be A.

Factory Cost of Jobs:

Job 101 = Rs. 96,000 + Rs. 42,000F

Job 102 = Rs. 67,500 + Rs. 30,000F

Total Cost of Production of Jobs:

Job 101 = (Rs.96,000 + Rs.42,000F) + (Rs.96,000 + Rs.42,000F)A= Rs.1,51,500
Job 102 = (Rs.67,500+ Rs.30,000F) + (Rs.67,500 + Rs.30,000F)A = Rs.1,06,875
(Refer to Working Note)
On solving above relations:
F = 0.60 and A = 0.25

Hence percentage recovery rates of factory overheads and administrative overheads are 60% and 25% respectively.

Working Note:

	Job 101	*Job 102*
Total cost of production (Rs.)	1,51,300	1,06,875
$\frac{\text{Selling price}}{(100\% + \text{Percentage of profit})}$	*(Rs. 1,66,650/110%)*	*(Rs. 1,28,250/120%)*

(ii) **Statement of jobs, showing amount of factory Overheads, administrative overheads and profit**

	Job 101	*Job 102*
	Rs.	*Rs.*
Direct Materials	54,000	37,500
Direct Wage	42,000	30,000
Prime Cost	96,000	67,500
Factory Overheads		
60% of Direct Wages	25,200	18,000
Factory Cost	1,21,200	85,500
Administrative Overheads		
25% of Factory Cost	30,300	21,375
Total Cost	1,51,500	1,06,857
Profit (difference figure)	15,150	21,375
Selling Price	1,66,650	1,28,250

(iii) **Selling price of Job 103**

	Rs.
Direct Materials	24,000
Direct Wages	20,000
Prime Cost	44,000
Factory overheads (60% of Direct Wages)	12,000
Factory Cost	56,000
Administrative Overheads (25% of Factory Cost)	14,000
Total Cost	70,000
Profit Margin (difference figure)	10,000
Selling Price $\left[\frac{\text{Total cost}}{87.5\%}\right]$	80,000

Question 37

Distinguish between Controllable and Uncontrollable costs. *(May, 2003, 2 marks)*

Answer

Controllable costs and Uncontrollable costs: Direct costs comprising of direct labour, direct material, direct expenses and some of the overheads are generally controllable by shop floor management.

Uncontrollable costs are those costs which cannot be influenced by the action of a specified member of an undertaking e.g. share to tool room expenditure which is apportioned to machine shop is not to be controlled by the machine shop foreman.

Question 38

A manufacturing company has an installed capacity of 1,20,000 units per annum. The cost structure of the product manufactured is as under:

		Rs.
(i)	*Variable cost per unit -*	
	Materials	*8*
	Labour (Subject to a minimum of Rs. 56,010 per month)	*8*
	Overheads	*3*

(ii) Fixed overheads Rs. 1,68,750 per annum

(iii) Semi-variable overheads – Rs. 48,000 per annum at 60% capacity, which increase by Rs. 6,000 per annum for increase of every 10% of the capacity utilisation or any part thereof, for the year as a whole.

The capacity utilisation for the next year is estimated at 60% for two months, 75% for six months and 80% for the remaining part of the year. If the company is planning to have a profit of 25% on the selling price, calculate the selling price per unit. Assume that there are no opening and closing stocks.
(Nov, 1997, 12 marks)

Answer

Statement of Selling Price and Profit

	Rs.
Material	7,12,000
89,000 units x Rs. 8 p.u.	
(Refer to working note 1)	
Labour cost	7,28,000
(Refer to working note 2)	
Variable overheads	2,67,000
(89,000 units x Rs. 3)	
Semi-variable overheads	60,000
(Refer to working note 3)	
Fixed overheads	1,68,750
Total cost	19,35,750
Add: Profit *@ 25% of selling price or*	
33-1/3% on cost	6,45,250
Total sales value	25,81,000
Selling price per unit	29.00
(Rs. 25.81.000/89,000 units)	

Working notes

1. Capacity utilisation (for the next year)

   60% of capacity for first two months = 2 months×6,000 units = 12,000 units

75% capacity for next six months = 6 months× 7,500 units = 45,000 units

80% of capacity for the remaining four months = 4 months× 8,000 units = 32,000 units

Total capacity utilisation

89,000 units

Capacity utilisation = $\frac{89{,}000 \text{ units}}{1{,}20{,}000 \text{ units}} \times 100$ = 74-1/6 %

2. Calculation of labour cost (subject to a minimum of Rs. 56,000 p.m.)

	Rs.
Labour cost of first two months	
12,000 units x Rs. 8 = Rs. 96,000	
But minimum here is	1,12,000
Labour cost of next six months	
45,000 units x Rs. 8 = Rs. 3,60,000	3,60,000
Labour cost of last four months	
32,000 units x Rs. 8	2,56,000
Total labour cost	7,28,000

3. Calculation of semi-variable overheads (per annum):

	Rs.
Semi-variable overheads	48,000
at 60% capacity	
Semi-variable overheads for additional	
14-1/6% capacity are the same as that for	
20% of the capacity utilisation for the whole year	12,000
	60,000

Question 39

The following figures are extracted from the Trial Balance of Gogetter Co. on 30th September, 1986:

	Rs.	*Rs.*
Inventories :		
Finished Stock	*80,000*	
Raw Materials	*1,40,000*	
Work-in-Process	*2,00,000*	
Office Appliances	*17,400*	

Plant & Machinery		*4,60,500*	
Buildings		*2,00,000*	
Sales			*7,68,000*
Sales Return and Rebates		*14,000*	
Materials Purchased		*3,20,000*	
Freight incurred on Materials		*16,000*	
Purchase Returns			*4,800*
Direct Labour		*1,60,000*	
Indirect Labour		*18,000*	
Factory Supervision		*10,000*	
Repairs and Upkeep Factory		*14,000*	
Heat, Light and Power		*65,000*	
Rates and Taxes		*6,300*	
Miscellaneous factory expenses		*18,700*	
Sales commission		*33,600*	
Sales Travelling		*11,000*	
Sales Promotion		*22,500*	
Distribution Deptt—Salaries and Expenses		*18,000*	
Office Salaries and Expenses		*8,600*	
Interest on Borrowed Funds		*2,000*	
Further details are available as follows:			
(i)	*Closing Inventories :*		
	Finished Goods	*1,15,000*	
	Raw Materials	*1,80,000*	
	Work-in-Process	*1,92,000*	
(ii)	*Accrued expenses on*		
	Direct Labour	*8,000*	
	Indirect Labour	*1,200*	
	Interest on Borrowed Funds	*2,000*	
(iii)	*Depreciation to be provided on:*		
	Office Appliances	*5%*	
	Plant and Machinery	*10%*	
	Buildings	*4%*	
(iv)	*Distribution of the following costs:*		

Hear, Light and Power to Factory, Office and Distribution in the ratio 8:1:1.

Rates and Taxes two-thirds to Factory and one-third to Office.

Depreciation on Buildings to Factory, Office and Selling in the ratio 8:1:1.

With the help of the above information, you are required to prepare a condensed profit and loss statement of Gogetter Co. for the year ended 30th September, 1986 along with supporting schedules of:

(i) Costs of Sales.

(ii) Selling and Distribution Expenses,

(iii) Administration Expenses.

Answer

Profit and Loss Statement of Gogetter Company
for the year ended 30th September, 1986

	Rs.	*Rs.*
Gross Sales	7,68,000	
Less : Returns	14,000	7,54,000
Less: Cost of Sales		7,14,020
Refer to Schedule (i)		
Net Operating Profit:		39,980
Less: Interest on Borrowed Funds,		4,000
Net Profit.		35,980

(i) Schedule of Cost of Sales

	Rs.	*Rs.*
Raw Material		1,40,000
(Inventory op. Balance)		
Add: Material Purchased	3,20,000	
Freight on Material	16,000	
Less: Purchase Returns	4,800	3,31,200
Less: Closing Raw Material Inventories		1,80,000
Material used in production		2,91,200
Direct Labour		1,68,000
Factory Overheads		
Indirect Labour	19,200	
Factory Supervision	10,000	
Repairs and Factory Upkeep	14,000	
Heat, Light and Power	52,000	
Rates and Taxes	4,200	

Miscellaneous Factory Expenses	18,700	
Depreciation of Plant	46,050	
Depreciation of Buildings	6,400	1,70,550
Gross Works Cost		6,29,750
Add: Opening work-in-process Inventory		2,00,000
		8,29,750
Less: Closing work-in-process Inventory		1,92,000
Works Cost		6,37,750
Add: Administration Expenses *[See Schedule (iii)]*		18,870
Total Cost of output		6,56,620
Add: Opening Finished Goods Inventory		80,000
		7,36,620
Less: Closing finished goods inventory		1,15,000
Cost of production of goods sold		6,21,620
Add: Selling and Distribution Expenses *[See Schedule (ii)]*		92,400
Cost of Sales		7,14,020

(ii) Schedule of Selling and Distribution Expenses

	Rs.
Sales Commission	33,600
Sales Travelling	11,000
Sales Promotion	22,500
Distribution Deptt.- Salaries and Expenses	18,000
Heat, Light and Power	6,500
Depreciation of Buildings	800
	92,400

***(*iii) Schedule of Administration Expenses**

	Rs.
Office Salaries and Expenses	8,600
Depreciation of Office Appliances	870
Depreciation of Buildings	800
Heat, Light and power	6,500
Rates and Taxes	2,100
	18,870

Question 40

The cost structure of an article the selling price of which is Rs. 45,000 is as follows:

Direct Materials	*50%*
Direct Labour	*20%*
Overheads	*30%*

An increase of 15% in the case of materials and of 25% in the cost of labour is anticipated. These increased costs in relation to the present selling price would cause a 25% decrease in the amount of profit per article.

Your are required

(1) To prepare a statement of profit per article at present, and

(2) The revised selling price to produce the same percentage of profit to sales as before.

Answer

Working Notes

1. Let 'x' be the total cost and 'y' be the profit for an article whose selling price is Rs. 45,000

   Hence x + y =Rs. 45,000 (A)

2. Statement Showing Present and anticipated cost per article

Item	*Present Cost*	*Increase*		*Anticipated cost*
	Rs.	*%*	*Rs.*	*Rs.*
(1)	(2)	(3)	(4)	(5)=(2) + (4)
Direct Material Cost	0.5x	15	0.075x	0.575x
Direct Labour	0.2x	25	0.050x	0.250x
Overheads	0.3x	--	--	0.300x
	x		0.125x	1.125x

3. The increase in the cost of direct material and direct labour has reduced the profit by 25 per cent (as selling price remained unchanged). The increase is cost and reduction in profit can be represented by the following relation:

   1.125x + 0.75y = Rs. 45,000 (B)

4. On solving relations (A) and (B) as obtained under working notes 1 and 3 above we get.

   We get

   x = Rs. 30,000

   y = Rs. 15,000

(a) Present Statement of Profit Per Article

	Rs.	*Rs.*
Direct Material Cost	0.5x	15,000
Direct Labour Cost	0.2x	6,000
Overheads	0.3x	9,000
Total Cost		30,000
Profit		15,000
Selling Price		45,000

Note: Profit as a percentage of Cost Price = 50%

(Rs. 15,000/Rs. 30,000) x 100

Profit as a percentage of Selling Price = 33-1/3%

(Rs. 15,000/Rs. 45,000) x 100

(b) Statement of Revised Selling Price

	Rs.	*Rs.*
Direct Material Cost	0.575x	17,250
Direct Labour Cost	0.250x	7,500
Overheads	0.300x	9,000
Total Anticipated Cost		33,750
Profit *(33-1/3% of selling price)*		16,875
Selling Price		50,625
(Rs. 33,750 x 100) 66.66		

Question 41

Two workmen, Vishnu and Shiva, produce the same product using the same material. Their normal wage rate is also the same. Vishnu is paid bonus according to the Rowan system, while Shiva is paid bonus according to the Halsey system. The time allowed to make the product is 100 hours. Vishnu takes 60 hours while Shiva takes 80 hours to complete the product. The factory overhead rate is Rs. 10 per man-hour actually worked. The factory cost for the product for Vishnu is Rs. 7,280 and for Shiva it is Rs. 7,600.

You are required:

(a) to find the normal rate of wages;

(b) to find the cost of materials ;

(c) to prepare a statement comparing the factory cost of the products as made by the two workmen.

Answer

Working Notes

1. Let X be the Cost of material and Y be the normal rate of wages per hour.

Factory Cost of Workman Vishnu

	Rs.
Material Cost	X
Wages	60Y
Bonus	24Y
$\left[\frac{40 \times 60}{100}\right]$ Y	
Overheads	600
i.e.	X + 60Y + 24Y + Rs. 600 = Rs. 7,280

Or	X + 84Y = Rs. 6,680	(i)

Factory Cost of Workman Shiva

	Rs.
Material Cost	X
Wages	80Y
Bonus	10Y
$\left[\frac{20 \times 50}{100}\right]$ Y	
Overheads	800
i.e.	X+ 80Y + 10Y + Rs. 800=Rs. 7,600
Or	X + 90Y = Rs. 6,800 (ii)

2. On solving the above relations (i) and (ii), the value of X and Y comes to Rs. 500/- and Rs.20 per hour.

3. Bonus paid to Vishnu = 24Y = Rs. 480

   Bonus paid to Shiva = 10Y = Rs. 200

   (a) The normal rate of wages comes to Rs. 20/- per hour (Refer to Working Notes (i) and (ii)

   (b) The cost of material comes to Rs. 5,000 on substituting the value of Y in either of the above relations (i) or (ii).

   (c) Comparative Statement of the Factory Cost of the product made by the two workmen.

	Vishnu	*Shiva*
	Rs.	*Rs.*
Material cost	5,000	5,000
Direct Wages	1200	1,600
	(60 x Rs. 20)	*(80 x Rs. 20)*
Bonus	480	200
(Refer to Working Note (3)		
Factory overhead	600	800
Factory cost	7,280	7,600

Question 42

A Ltd. Co. has capacity to produce 1,00,000 units of a product every month Its works cost at varying levels of production is as under:

Level	*Works cost per unit*
	Rs.
10%	*400*
20%	*390*
30%	*380*

40%	*370*
50%	*360*
60%	*350*
70%	*340*
80%	*330*
90%	*320*
100%	*310*

Its fixed administration expenses amount to Rs. 1,50,000 and fixed marketing expenses amount to Rs. 2,50,000 per month respectively. The variable distribution cost amounts to Rs. 30 per unit.

It can market 100% of its output at Rs. 500 per unit provided it incurs the following further expenditure:

(a) It gives gift items costing, Rs. 30 per unit of sale;

(b) It has lucky draws every month giving the first prize of Rs. 50,000; 2nd prize of Rs. 25,000 3rd prize of Rs. 10,000 and three consolation prizes of Rs, 5,000 each to customers buying the product.

(c) It spends Rs. 1,00,000 on refreshments served every month to its customers;

(d) It sponsors a television programme every week at a cost of Rs. 20,00,000 per month.

It can market 30% of its output at Rs. 550 per unit without incurring any of the expenses referred to in (a) to (d) above.

Advise the company on its course of action. Show the supporting cost sheets.

(Nov, 1998, 12 marks)

Answer

Cost Sheet (for the month)

Level of capacity	30%		100%	
Level of output Produce (Units)	*30,000*		*1,00,000*	
	Per Unit (Rs.)	*Total (Rs.)*	*Per Unit (Rs.)*	*Total (Rs.)*
Works cost	380.00	1,14,00.000	310,00	3,10,00,000
Add: Fixed administration expenses	5.00	1,50,000	1.50	1,50,000
Cost of production	385.00	1,15,50,000	311,50	3,11,50,000
Add: Fixed marketing expenses	8.33	2,50,000	2.50	2,50,000
Add: Variable distribution cost	30.00	9,00,000	30.00	30,00,000
Add: Special cost				
Gift items cost	–	–	30.00	30,00,000
Customer's prizes	–	–	1.00	1,00,000
Refreshments	–	–	1.00	1,00,000
Television programme sponsorship cost	–	–	20.00	20,00,000
Cost of sales	423.33	1,27,00,000	396.00	3,96,00,000
Profit	126.67	23,00,000	104.00	1,04,00,000
Sale revenue	550.00	1,50,00,000	500.00	5,00,00,000

Advise to the company about the course of action to be taken.

The profit of A Ltd. Co. is more by Rs. 81 lacs (Rs. 104 lacs – Rs. 23 lacs), if uses its capacity to produce 1,00,000 units of a product per month. Hence, it is advisable to the Company to produce 1,00,000 units and incur the special costs for the marketing of its 100% output.

Question 43

Conversion Cost and Added Value.

Answer

Conversion cost is the production cost excluding the cost of direct material (but including the cost resulting fro variations in direct material, weight or volume) of producing partly or fully finished products. In other words, conversion cost of finished product or work in-progress is comprised of direct labour and the manufacturing overhead.

Added value means the charge in market value resulting from an alteration in the form, location or availability of a product of service, excluding the cost of bought out materials or services. Unlike conversion cost, it includes profit.

Question 44

A re-roller produced 400 metric tons of M.S. bars spending Rs. 36,00,000 towards materials and Rs. 6,20,000 towards rolling charges. Ten percent of the output was found to be defective, which had to be sold at 10% less than the price for good production. If the sales realization should give the firm an Overall profit of 12.5% on cost, find the selling price per metric ton of both the categories of bars. The scrap arising during the rolling process fetched a realization of Rs. 60,000.

(6 Marks)

Answer

Computation of Selling Price

	Rs.		
Cost of Materials	36,00,000		
Less: Scrap	60,000	Rs.	35,40,000
Rolling charges			6,20,000
Total cost			41,60,000
Add Profit (12.5% on cost)			5,20,000
Sales value		Rs.	46,80,000

Output (effective)

$$360 \text{ tons} + \frac{9}{10} \times 40 \text{ tons} = 396 \text{ tons}$$

Selling price per MT of good output

= Rs. 46,80,000/396

= Rs. 11,818.18

Selling price of defective per MT

= 0.9× Rs. 11,818.18 = Rs. 10,636.36

Question 45

XYZ Auto Ltd. is in the business of selling cars. It also sells insurance and finance as part of its overall business strategy. The following information is available for the company.

	Physical Units	*Sales Value*
Sales of Cars	*10,000 Cars*	*Rs. 30,000 lacs*
Sales of Insurance	*6,000 Policies*	*Rs. 1,500 lacs*
Sales of Finance	*8,000 Loans*	*Rs. 19,200 lacs*

The Revenue earnings from each line of business before expenses are as follows:

Sale of Cars	*3% of Sales value*
Sale of Insurance	*20% of Sales value*
Sale of Finance	*2% of Sales value*

The expenses of the company are as follows:

Salesman salaries	*Rs. 200 lacs*
Rent	*Rs. 100 lacs*
Electricity	*Rs. 100 lacs*
Advertising	*Rs. 200 lacs*

Documentation cost per insurance policy	*Rs. 100*
Documentation cost for each loan	*Rs. 200*
Direct sales expenses per car	*Rs. 5,000*

Indirect costs have to be allocated in the ratio of physical units sold.

Required:

(i) Make a cost sheet for each product allocating the direct and indirect costs and also showing the product wise profit and total profit.

(ii) Calculate the percentage of profit to revenue earned from each line of business.

(6 + 8 = 14 marks)

Answer

Product Cost Sheet

Total	**Cars**	**Insurance**	**Finance**

Sales units		10,000	6,000	8,000
Sales value (Rs in lakhs)		30,000	1,500	19,200
Revenue earnings		3%	20%	2%
Revenue earned (Rs in lakhs)	1584	900	300	384
Direct costs (Rs in lakhs)	522	500*(5000 × 10000)*	6*(100 × 6000)*	16 *(200 × 8000)*
Indirect costs (allocated in the ratio of physical units sold) 0.4167:0.25:0.3333				
Salesman salaries (Rs in lakhs)	200			
Rent (Rs in lakhs)	100			
Electricity (Rs in lakhs)	100			
Advertising (Rs in lakhs)	200			
	600	250	150	200
Total costs	**1122**	**750**	**156**	**216**
Profits (Revenue – Total cost)	462	150	144	168
% of Profits to revenue earned	29.17%	16.67%	48%	43.75%

Question 46

A Manufacturing Company has an installed capacity of 1,50,000 units per annum. Its cost structure is given below:

		Rs.
(i)	*Variable cost per unit*	
	Materials	*10*
	Labour (subject to a minimum of Rs. 1,00,000 per month)	*10*
	Overheads	*4*
(ii)	*Fixed overheads per annum*	*1,92,300*
(iii)	*Semi-variable overheads per annum at 75% capacity (It will increase by Rs. 4,000 per annum for increase of every 5% of the capacity utilisation or any part thereof)*	*60,000*

The capacity utilisation for the next year is budgeted at 75% for first three months, 80% for the next six months and 90% for the remaining three months.

Required:

If the company is planning to have a profit of 20% on the selling price, calculate the selling price per unit for the next year.

Answer

Working Notes:

(i) Installed capacity per month $\frac{1,50,000}{12}$ =12,500 units

(ii)

Capacity utilisation	75%	80%	90%
Production per month (units)	**9,375**	**10,000**	**11,250**
Total production (units)	**3×9,375 = 28,125**	**10,000 ×6 = 60,000**	**11,250 ×3 = 33,750**
Total		**1,21,875 units**	

(iii) **Calculation of labour cost:**

Capacity	75%	80%	90%
Production per month (units)	**9,375**	**10,000**	**11,250**
Labour @ 10 (subject to minimum 1,00,000)	**93,750 i.e. minimum 1,00,000**	**1,00,000**	**1,12,500**
Total labour cost	**3×1,00,000 = 3,00,000**	**6 ×1,00,000 = 6,00,000**	**3 ×1,12,500 = 3,37,500**
Total		**Rs 12,37,500**	

(iv) **Calculation of semi variable overheads:**

	75%	80%	90%
Semi variable Overhead per month	$\frac{60,000}{12}$ = 5,000	$\frac{60,000+4,000}{12}$ = 5333.66	$\frac{60,000+12,000}{12}$ = 6,000
Total Semi-variable Overhead	**3×5,000 = 15,000**	**6 ×5333.66 = 32,000**	**3 ×6,000 = 18,000**

Total Rs. 65,000

Calculation of selling price per unit:

	Rs.
Material costs 1,21,875 @ 10	**12,18,750**

Labour cost	**12,37,500**
Overheads 1,21,875 @ 4	**4,87,500**
Semi-variable Overheads	**65,000**
Fixed Overheads	**1,92,300**
Total cost	**32,01,050**
Profit 20% on selling price i.e., 25% on cost	**8,00,262.50**
Sales	**40,01,312.50**
Selling price/unit $= \frac{40,01,312.50}{1,21,875}$	**Rs. 32.83**

Question 47

Answer any the following:

(i) Explicit and Implicit Costs *(May 2007, 2 marks)*

(ii) Period Costs and Discretionary Costs *(May, Nov, 2007, 2 marks)*

Answer

(i) Explicit and Implicit cost:

Explicit costs, which are also known as out of pocket costs, refer to costs involving immediate payment of cash. Salaries, wages, interest on loan etc. are examples of explicit costs. They can be easily measured.

The main points of difference between explicit and implicit costs are:

- Implicit costs do not involve immediate cash payment.
- They are not recorded in the books of account.
- They are also known as economic costs.

(ii) Period and Discretionary costs

There are the costs, which are not assigned to the products but are charged as expenses against the revenue of the period in which they are incurred. All non-manufacturing costs such as general and administrative expenses, selling and distribution expenses are period costs.

Such costs are not tied to a clear cause and effect relationship between inputs and outputs. They arise from periodic decisions regarding the maximum outlay to be incurred. Examples are – advertising, public relations, training etc.

Question 48

Explain Profit centres and investment centres. *(Nov, 2008, 2 Marks)*

Answer

Profit Centres and Investment Centres:

Centres which have the responsibility of generating and maximizing profits are called profit centres.

Those centres which are concerned with earning an adequate return on investment are known as Investment centres.