

Paper 5 – Cost Management
(One Paper – Three Hours -- 100 Marks)

Level of Knowledge: Expert Knowledge.

Objectives: To gain expert knowledge of:
(a) Use of costing data decision-making and control, and
(b) Emerging modern cost management concepts.

Contents:

1. Cost concepts in decisions-making; Relevant cost, Differential cost, Incremental Cost and Opportunity cost; Objectives of a Costing System; Inventory Valuation; Creation of Database for operational control; Provision of data of Decision-Making.
2. Marginal Costing; Distinction between Marginal Costing and Absorption Costing; Break-Even Analysis; Cost –Volume –Profit Analysis; Various decision-making problems.
3. Standard Costing and Variance Analysis.
4. Pricing decision including pricing strategies; Pareto Analysis.
5. Target Costing, Life Cycle Costing
6. Costing of Service Sector
7. Measurement of Divisional profitability – pricing decisions including transfer pricing.
8. Activity Based Cost Management.
9. Just-in-time Approach, Material Requirement Planning, Enterprise Resource Planning.
10. Total Quality Management.
11. Value Chain Analysis
12. Budgetary Control & Performance measurement: Flexible Budgets; Performance Budgets; Zero based Budgets; Balanced Score Card; Bench Marking; Theory of Constraint.
13. Quantitative techniques for cost management: Linear Programming, PERT/CPM, Transportation problems, Assignment problems, Simulation, Learning Curve Theory.

Some important instruction

1. How to prepare Class note?
2. How to prepare for the exam to ensure quality answer?
3. How to prepare before day of exam

Answer:

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Total @ 3 Hrs. without break

73

Cost Accounting Standard- some important points

What is Cost Accounting?

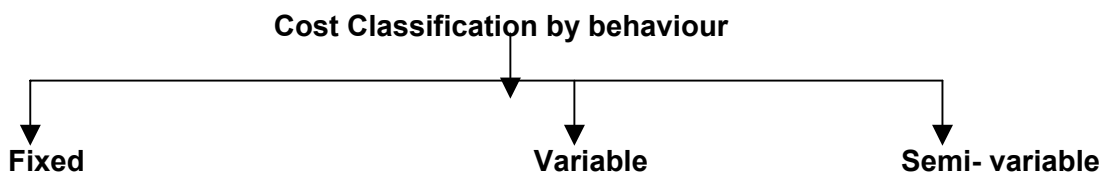
Cost accounting is the application of accounting and costing principles, methods and techniques in the ascertainment of costs and the analysis of savings and/or excess as compared with previous experience or with standards.

CIMA defines Cost Accounting as "the establishment of budgets, standard costs and actual costs of operations, processes, activities or products, and the analysis of variances, profitability or the social use of funds."

CAS-1: Definitions of costs

- 4.1 **Cost:** Cost is measurement, in monetary terms, of the amount of resources used for the purpose of production of goods or rendering services.
- 4.2 **Cost Centre:** Any unit of Cost Accounting selected with a view to accumulating all cost under that unit. The unit may be a product, a service, division, department, section, a group of plant and machinery, a group of employees or a combination of several units. This may also be a budget centre or Cost Object
- 4.3 **Cost unit** is a form of measurement of volume of production or service. This unit is generally adopted on the basis of convenience and practice in the industry concerned.
- 4.1.1 **Example of cost Units:**
- | | | |
|--------------|-----|-------------|
| Power | --- | MW |
| Cement/Steel | --- | MT |
| Automobile | --- | Number etc. |
- 6.4 **By Behaviour**

Costs are classified based on behaviour as fixed cost, variable cost and semi-variable cost depending upon response to the changes in the activity levels



Fixed Cost is the cost, which does not vary with the changes in the volume of activity in the short run. These costs are not affected by temporary function in activity of an enterprise. These are also known as period costs.

Variable Cost is the cost of elements, which tends to directly vary with the volume of activity. Variable cost has two parts – (a) Variable direct costs; and (b) Variable indirect costs. Variable indirect cost is termed as variable overhead.

Semi-variable Costs contain both fixed and variable elements. They are partly affected by fluctuation in the level of activity.

Proforma of Cost Sheet

	(1)	Direct Materials Cost (a)
	(2)	Direct Labour Cost
	(3)	Direct Expenses
(1) + (2) + (3) =	(4)	Prime Cost
	(5)	Production Overhead
	(6)	Administrative Overhead
	(7)	Research & Development Cost (apportioned)
(4) + (5) + (6) + (7) =	(8)	Cost of Production (b)
	(9)	Selling Cost
	(10)	Distribution Cost
(8) + (9) + (10) =	(11)	Cost of Sales

Note: To arrive at value at different point as indicated above adjustment with opening and closing stock is necessary at following different points:

- (a) Opening and closing stock of raw materials
- (b) Opening and closing stock of work-in-progress & finished goods

CAS – 2: Capacity determination

- 4.4** 'Normal Capacity' is the production achieved or achievable on an average over a period or season under normal circumstances taking into account the loss of capacity resulting from planned maintenance.

CAS-3: "Overheads"

- 4.1** Overheads --- Overheads comprise of indirect materials, indirect employee costs and indirect expenses, which are not direct expenses which are not directly identifiable or allocable to a cost object in an economically feasible way.
- 4.2** Collection of overhead --- Collection of overheads means the pooling of indirect items of expenses from books of account and supportive / corroborative records in logical groups business regards to their nature and purpose.
- 4.3** Allocation of overheads --- allocation of overheads is assigning whole items of cost directly to a cost centre.
- 4.4** Apportionment of overhead: Apportionment of overheads to more than one cost centre on some equitable basis.
- 4.5** Primary and Secondary Distribution of Overheads

- 4.6 Absorption of overheads --- Absorption of overheads is charging of overheads from cost centres to products or services by means of absorption rates for each cost center, which is calculated as follows:**

$$\text{Overhead absorption rate} = \frac{\text{Total overheads of the cost centre absorption}}{\text{Total quantum of base}}$$

The base (denominator) is selected on the basis of type of the cost centre and its contribution to the products or services, for example, machine hours, labour hours, quantity produced, etc.

Overhead absorbed = Overhead absorption rate × units of base in product or service

- 4.7 Normal Capacity** is the production achieved or achievable on an average over a period or season under normal circumstances taking into account the loss of capacity resulting from planned maintenance. (CAS -2)

- 5.4 Common bases for absorption of production overheads from, production centres to products or services**

Base of denominator	Applicability
Unit of production	when single product is produced or various products are similar in specification.
Direct labour cost	when conversion process is labour intensive and wage Rates are substantially uniform
Direct labour hour	when conversion process is labour intensive
Machine Hours or Vessel Occupancy or Reaction or Crushing Hours etc.	When production mainly depends on performance have the base

6. Apportionment and absorption of Administrative Overheads

- 6.1 Administrative overheads included the following items of cost:**
 Printing and stationery, other office supplies
 Employees cost – salaries of administrative staff
 Establishment expenses – Office rent & rates, insurance, depreciation of office building and other assets, legal expenses, audit fees, bank charges, etc.
- 6.2 Administrative overheads are to be collected in different costs pools such as:**
- General Office
 - Personnel department
 - Accounts department
 - Legal department
 - Secretarial department. Etc.
- 6.3 Administrative overheads are to be further analysed into two-one for production activities and other for sales and distribution activities. Costs collected under the cost pools Indicated in 6.2 above are to be distributed to administrative overheads relating to production activities and administrative overheads relating to selling and distribution activities on rational basis for each cost pool.**

- 6.4 Administrative overheads relating to production activities are to be apportioned to different production cost centres on the basis conversion costs of production cost centres. The apportioned overheads are absorbed to products on the basis of the normal capacity or actual capacity, whichever is higher.**

In case of under-absorption or over absorption of administrative overhead relating to production, the same shall also be adjusted with Costing Profit & Loss Account.

- 6.5 Some items of selling overheads and distribution overheads are directly identified and absorbed to products or services and remaining part of selling and distribution overhead along with the with share of administration overheads relating to selling and distribution activities are to be apportioned to various products or jobs or services on the basis of net actual sales value (i.e. Gross sales value less excise duty, sales tax and other government levies).**

CAS – 4: Captive Consumption

- 4.2 Captive Consumption:** Captive Consumption means the consumption of goods manufactured by one division or unit and consumed by another division or unit of the same organization or relate undertaking for manufacturing another product(s).

Statement of Cost of Production _____ manufactured / to be manufactured during the period _____

		Qty	
Q1	Quantity Produced (Unit of Measure)		
Q2	Quantity Dispatched (Unit of Measure)		
	Particular	Total cost (Rs.)	Cost/ unit (Rs.)
1.	Materials Consumed		
2.	Direct Wages and Salaries		
3.	Direct Expenses		
4.	Works Overheads		
5.	Quality Control Cost		
6.	Research & Development Cost		
7.	Administrative Overhead (relative to production activity)		
8.	Total (1 to 7)		
9.	Add: Opening stock of Work-in progress		
10.	Less: Closing stock of Work-in-progress		
11.	Total (8 +9 – 10)		
12.	Less: Credit for Recoveries /Scrap/By products /misc. income		
13.	Packing cost		
14.	Cost of production (11 –12 + 13)		
15.	Add: Inputs received free of cost		
16.	Add: Amortised cost of Moulds. Tools. Dies & Patterns etc., received free of cost		
17.	Cost of production for goods produced for captive consumption (14 + 15+ 16)		
18.	Add: Opening stock of finished goods		
19.	Less: Closing stock of finished goods		
20.	Cost of production for goods dispatched (17 + 18 – 19)		

This cost statement has been adopted by ICAI (Ref: Students' Journal Pg. 7 of July, 2004)

CAS 5 : Transport cost

Guidance note issued :

CAS 6 : On Transfer Pricing

CAS 7 : On Jt. & By- Product

Some Basic Concept

1. Outline the key attributes of an operational database

Answer: The key attributes of an operational database are:

- (1) Consistency of related information elements: Operating personnel are alert for information that is inconsistent with information they already possess. If information from different source about the transaction is consistent, this information, as well as the information system, has greater validity.
- (2) Timeliness: of transactions information and of managerial reports. Because of simultaneous updating of all records affected by a transaction and the frequent use of on-line transactions entry, database records are more likely than conventional files.
- (3) Back-up: detail provided by inquiry capability: Operations personnel refer to backup details to answer customer questions about account status. Also all managers can cite many instances when they have received highly summarized unexplained circumstances such as a production cost variance. Frequently the data needed exists in the computer system.
- (4) Data sharing: The sharing of a large pool of operations data among multiple user departments is possible with a database. Without a database, information about other department's activities probably would be available only several days after the end of each accounting period, if at all.

2. "Cost may be classified in a variety of ways according to their nature and the information needs of the management." Explain.

Answer: Costs can be classified according to their nature and information needs of the management in the following manner:

- i. By element: Under this classification costs are classified into (a) Direct costs and (b) Indirect costs according to elements viz., materials, labour and expenses.
- ii. By function: Hence costs are classified as: production cost; administration cost; selling costs; distribution cost; research cost; development cost, etc.
- iii. By behavior: According to this classification costs are classified as fixed; variable and semi variable costs. Fixed costs can be further classified as committed and discretionary.
- iv. By controllability: Costs are classified as controllable and non-controllable costs.
- v. By normality: Under this classification costs are segregated as normal and abnormal costs.

Management of a business house requires cost information for decision making under different circumstances. For example they required such information for fixing selling price, controlling and reducing costs. To perform all these functions a classification of cost according to their nature and information needs is an essential pre-requisite of the management.

3. Explain the concept of discretionary costs. Give three examples. Discuss, how control may be exercised over discretionary costs.

Answer. Discretionary cost can be explained with the help of following two important features.

- i. They arise from periodic (usually yearly) decisions regarding the maximum outlay to be incurred.
- ii. They are not tied to a clear cause and affect relationship between inputs and outputs.

Examples of discretionary costs includes : advertising, public relations, executive training, teaching, research, health care and management consulting services.

The noteworthy feature of discretionary costs is that managers are seldom confident that the "correct" amounts are being spent.

Control over discretionary costs : To control discretionary costs control points / parameters may be established. But these points need to be devised individually. For research and development function to control discretionary costs, dates may be established for submitting major reports to management. For advertising and sales promotion, such costs may be controlled by pre-setting targets. In the case of employees benefits, discretionary costs may be controlled by calling a meeting of employees union and making them aware that the company would meet only the fixed costs and the variable costs should be met by them.

4. Distinguish between 'Committed Fixed Costs' and 'Discretionary Fixed Costs'.

Answer : Committed fixed costs, are those fixed costs that arise from the possession of : (i) a plant, building and equipment (e.g. depreciation, rent, taxes, insurance premium etc.) or (ii) a functioning organisation (i.e. salaries of staff). These costs remain unaffected by any short-run actions. These costs are affected primarily by long-run sales forecasts that, in turn indicates the long-run capacity targets. Hence careful long range planning, rather than day-to-day monitoring, is the key to managing committed costs.

Discretionary fixed costs, (some called managed costs or programmed costs). These costs have two important features :

- i. they arise from periodic (usually yearly) decisions regarding the maximum outlay to be incurred, and
- ii. they are not tied to a clear cause-and-effect relationship between inputs and outputs. Examples of discretionary fixed costs includes – advertising, public relations, executive training, teaching, research, health care etc. These costs are controllable.

5. Distinction between Cost reduction and Cost management:

Cost reduction is the achievement of real and permanent in the unit cost of goods manufactured or services rendered without impairing or reducing the quality of the product. It uses the techniques like value analysis, work-study, standardization, simplification etc. It is a continuous process of critical cost examination, analysis and challenges of established standards. Each aspect of the business namely products, processes, methods, procedures is critically examined and reviewed with a view to improving the efficiency and effectiveness so that cost are reduced. It presumes the existence of concealed potential savings in norms or standards. It is a corrective action.

Cost management is a broader concept. It aims at optimal utilization of resources to enhance the operating income of the firm. It does not consider product attributes as given. It does not focus on cost independent of revenue. Cost management system establishes linkage between cost and revenues. It relates costs with product to have an insight into how various attributes generates revenue and create demand on resources. It provides information to manage product attributes to optimize resource utilization.

Traditional cost reduction systems focus on products, while cost management systems focus on products, markets, and customers.

Budgetary Control & Performance Measurement

1. Define Budget & Budgetary control. State the objectives of budget.

Budgets. A budget is a financial and/or quantitative statement, prepared prior to a defined period of time, of the policy to be pursued during that period for the purpose of attaining a given objective & must be approved.

An analysis of this definition will reveal the essential features of a budget namely that

- (I) a budget may be expressed in terms of money or quantity, or both
- (II) it should be developed prior to the period during which it is to operate,
- (III) it is set for a definite period, and
- (IV) before its preparation, the objective to be attained and the policy to be pursued to achieve that objective and required to be laid down.

Budgeting lays emphasis on the necessity for advance decision on future course of action to be followed and points out the result which would accrue by following that course of action.

The **objective** of setting budgets may be summarised as follows :-

- (a) A budget is a **blue print** of the desired plan of action or operation. Plans covering the entire organisation and all its functions like purchase, production, sales, financial management, research and development are expressed through budgets. The budget serves as a declaration of policies and also defines the objective for executives at all levels of management.
- (b) Budgets provide a **means of co-ordination** of the business as a whole . In the process of establishing budgets, the various factors like production capacity, sales possibilities, and procurement of material, labour, etc. are balanced and co-ordinates so that all the activities proceed according to the objective. Budgets inculcate team and are like putting so many heads together to solve a common problem.
- (c) Budgets are **means of communication**. Complex plans laid down by the top management are passed on to those who are responsible for putting them into action.
- (d) Budgets facilitate **centralised control** with delegated authority and responsibility. Grouped according to the responsibilities of different executive levels, they facilitate decentralisation of work. Budgets are instruments of managerial control by means of which the management can measure performances in every part of the concern and take corrective action as soon as any deviations from the budgets come to light.

Budgetary control is defined as

- a. the establishment of budgets relating the responsibilities of executives to the requirements of a policy and
- b. the continuous comparison of actual with budgeted results, either to secure by individual action the objective of that policy or to provide a basis for its revision..

It follows that a budgetary control system secures control over performances and related costs in different parts of a business by

- a. establishing budgets,
- b. comparing actual attainments against the budgets, and
- c. taking corrective action and remedial measures or revision of the budgets, if necessary.

2. What is programme budget?

Answer : This is a budgetary process meant to make government operation more effective and efficient. Developed in the U.S.A. in 1961, program budgeting is being used in the various departments of the U.S. Government. Some of the features of program budgeting that distinguish it from the conventional budgeting and performance budgeting are as follows : --

1. Program budgeting reconstructs budgets by accounting expenditure under output (Cash out flow) categories rather than objective categories. Budgets are established for each activity leading to the output such as defense, health, education etc.
2. Program budgeting is prospective; the other types of budget are retrospective. Program budgeting connotes planning in the real sense.
3. Programme budgeting is concerned with the purpose of work and not as much with the process of work. As a result, the programme budgeting are the programme of the top level management dealing with strategy. The process of the other types of budgeting is concerned with the problems of the lower and middle levels of management.
4. Program budgeting extends beyond one financial year and depending upon the activity concerned, it may extend for a long term, say two or five years till the final output is achieved.
5. Program budgeting is closely associated with social cost-benefit analysis.

3. What is Performance Budgeting (PB) ? Differs its from traditional budget. What are the steps required in PB?

Answer:

Performance Budgeting provide a meaningful relationship between estimated inputs and expected outputs as an integral part of the budgeting system. 'A performance budget is one which presents the purposes and objectives for which funds are required, the costs of the programmes proposed for achieving those objectives, and quantities data measuring the accomplishments and work performed under each programme. Thus PB is a technique of presenting budgets for costs and revenues in terms of functions. Programmes and activities are correlating the physical and financial aspect of the individual items comprising the budget.

Traditional budgeting vs. Performance budgeting

1. The traditional budgeting (TB) gives more emphasis on the financial aspect than the physical aspects or performance. PB aims at establishing a relationship between the inputs and the outputs.
2. Traditional budgets are generally prepared with the main basis towards the objects or items of expenditure i.e. it highlights the items of expenditure, namely, salaries, stores and materials, rates rents and taxes and so on. In the PB latter the emphasis is more on the functions of the organisation, the programmes to discharge these function and the activities which will be involved in undertaking these programmes.

Steps in PB:

According to the Administrative Reforms Commission (ARC) the following steps are the basic ones in PB :

- (a) establishing a meaningful functional programme and activity classification of government operations ;

- (b) bring the system of accounting and financial management in accord with this classification
- (c) evolving suitable norms, yardsticks, work units of performance and units costs, wherever possible under each programme and activity for their reporting and evaluation.

The Report of the ARC use the following terms in an integrated sequence :

Function → Programme → Activity → Project

The team 'function' is used in the sense of 'objective'. For achieving objectives 'programmes' will have to be evolved. In respect of time horizon, it is essentially a replacement of traditional annual fiscal budgeting by a more output-oriented, but still an annual, exercise.

For an enterprise that wants to adopt PB, it is thus imperative that :

- (a) the objectives of the enterprise are spelt out in concrete terms.
- (b) the objectives are then translated into specific functions, programmes, activities and tasks for different levels of management within the realities of fiscal; constraints ;
- (c) realistic and acceptable norms, yardsticks or standards and performance indicators should be evolved and expressed in quantifiable physical units.
- (d) a style of management based upon decentralised responsibility structure should be adopted, and
- (e) an accounting and reporting system should be developed to facilities monitoring, analysis and review of actual performance in relation to budgets.

4. **What is Zero base budget ? State, how is Zero base Budgeting superior to Traditional Budgeting.**

Answer : ZBB is defined as 'a method of budgeting which requires each cost element to be specifically justified, as though the activities to which the budget relates were being undertaken for the first time. Without approval, the budget allowance is zero'.

Zero – base budgeting is so called because it requires each budget to be prepared and justified from zero, instead of simple using last year's budget as a base. Incremental level of expenditure on each activity are evaluated according to the resulting incremental benefits. Available resources are then allocated where they can be used most effectively.

The major advantage of ZBB exercises is that managers are forced to consider alternative way of achieving the objectives of their activity and they are required to justify to activities which they currently undertake.

ZBB is some times referred to as Priority – based budgeting. It does not apply exclusively to non – operating budgets, but it is particularly relevant in this context

Zero base budgeting is superior to traditional budgeting in the following manner :

- It provides a systematic approach for evaluation of different activities.
- It ensure that the function undertaken are critical for the achievement of the objectives.
- It provides an opportunity for management to allocate resources to various activities after a proper cost benefit analysis.
- It helps in the identification of wasteful expenditure and then their elimination.
- If facilitates the close linkage of departmental budgets with corporate objectives
- It helps in the introduction of a system of Management by Objectives.

5. Limitations of ZBB

- (i) Various operational problems are likely to be faced in implementing the technique.
- (ii) The full support of top management is required.
- (iii) It is time consuming as well as costly
- (iv) It requires proper trained managerial staff

6. Budget Ratio

These ratios provide information about the performance level, i.e., the extent of deviation of actual performance from the budgeted performance and whether the actual performance is favourable or unfavorable. If the ratio is 100% or more, the performance is considered as favourable and if ratios is less than 100% the performance is considered as unfavourable.

The following ratios are usually used by the management to measure development from budget.

Capacity usage ratio: This relationship between the budgeted number of working hours and the maximum possible number of working hours in a budget period.

Standard capacity employed ratio: this ratio indicates the extent to which facilities were actually utilized during the budget period.

Level of activity ratio: This may be defined as the number of standard hours equivalent to work produced expressed as a percentage of the budget of standard hours.

Efficiency ratio: this ratio may be defined as standard hours equivalent of work produced expressed as a percentage of the actual hours spent in producing the work.

Calendar ratio: This ratio may be defined as the relationship between the number of working days in a period and the number of working days in the relative budget period.

7. What is Rolling Budgets ?

Answer : Rolling budgets can be particularly useful when future events cannot be forecast reliably. A rolling budget is defined as 'a budget continuously updated by adding a further accounting period (month or quarter) when the earliest accounting period has expired. Its use is particularly beneficial where future costs and/ or activities cannot be forecast accurately.'

For example a budget may initially be prepared for January to December, year 1. At the end of the first quarter, i.e., at the end of March, year 1, the first quarter's budget is deleted. A further quarter is then added to the end of the remaining budget, for January to March, year 2. the remaining portion of the original budget is updated in the light of current conditions. This means that managers have a full year's budget always available and the rolling process forces them to continually plan ahead.

A system of rolling budgets is also known as continuous budgeting.

It is not necessary for all of the budgets in a system to be prepared on a rolling basis. For example many organisations will use a rolling system for the cash budget only.

In practice most organisations carry out some form of updating process on all their budgets, so that the budgets represent a realistic target for planning and control purpose. The formalized budgetary planning process will still be performed on a regular basis to ensure a co-ordinated approach to budgetary planning.

8. Benchmarking (for problems ref pg- 62)

Benchmarking is the continuous process of measuring products, services or activities against the best level of performance that may be found either inside or outside the organisation. It is a process of comparing a firm's activities with best practices.

The process involves establishment of benchmarks (targets or comparators) through whose use the levels of performance of the company is sought to be improved. Benchmarking is a tool for continuous improvement because after identifying a best practice performance, it becomes a target to beat.

There may be two types of benchmarking :

- a. intra-group and
- b. inter-industry.

In the former case, groups of companies in the same industry agree that similar units within the co-operating companies will pool data on their processes. The processes are benchmarked against each other. Improvement task forces are established to identify and report "best practice" to all members of the group so that each participating company can achieve it and beat it.

In inter-industry benchmarking, non-competing firms with similar processes are identified and asked to participate in benchmarking exercise. The objective is to benefit from the experience of the other, and establish best practice in their common business processes.

Benchmarking can be applied in any business process or activity for continuous improvement—e.g. quality, cost, productivity, process, customer service, and so on. The steps in benchmarking are as follows.

1. Gather relevant data of participating departments or units, establish the benchmarks based on the best practices and communicate them to the relevant departments or participating units.
2. Measure actual performance to compare with the benchmarks.
3. Analyse the reasons for variations and report them to management for taking preventive and corrective actions.
4. Review the existing benchmarks to set new targets for continuous improvement.

A benchmark is a target fixed based on the best practice. It may be two types

- a. financial or
- b. non-financial measure or both.

Examples of financial benchmarks are

1. standard cost,
2. target profit,
3. sales revenue,
4. desired cash flow, etc.

Examples of non-financial benchmarks are

1. Targets in terms of market share,
2. customer satisfaction,
3. reduction in machine down-time,
4. target rate of return

Again, financial benchmark may be a part of the accounting system, e.g.

- a. standard costing,
- b. budgetary control and
- c. variance analysis

When target profit margin based on competitor's performance is accepted as the benchmark, it is obviously not a part of the accounting system.

Bench marking code of conduct

Bench marking is the process of identifying and learning from the best practices anywhere in the world. It is a powerful tool for continuous improvement. To contribute to efficient, effective and ethical bench marking, individuals agree for themselves and their organization to be abided by the following principles for the benchmarking with other organizations.

Suggested benchmarking code of conduct:

- (i) Principle of legality
- (ii) Principle of exchange
- (iii) Principle of confidentiality
- (iv) Principle of use
- (v) Principle of first party contact
- (vi) Principle of third party contact
- (vii) Principle of preparation

9. The theory of constraints (TOC)

The idea behind TOC is that raw materials should be turned into products that are immediately shipped to customers at the greatest possible speed, in a similar way to the JIT system.

The theory of constraints (TOC) describes methods to maximize operating income when faced with some bottleneck and some non bottleneck operations.

The three measurements:

1. Throughput contribution equals revenues minus the direct materials cost of the goods sold.
2. Investments equal the sum of materials costs in direct materials, work – in – process, and finished goods inventories; R & D costs; and costs of equipment and buildings.
3. Operating costs equal all costs of operations (other than direct materials) incurred to earn throughput contribution. Operating costs include salaries and wages, rent utilities, and depreciation.

The objective of TOC is to increase throughput contribution while decreasing investments and operating costs. TOC considers a short – run time horizon and assumes that operating costs are fixed costs. The steps in managing bottleneck operations are

- Step 1: Recognize that the bottleneck operation determines throughput contribution of the entire system.
- Step 2: Find the bottleneck operation by identifying operations with large quantities of inventory waiting to be worked on.
- Step 3: Keep the bottleneck operation busy and subordinate all non bottleneck operations to the bottleneck operation. That is, the needs of the bottleneck operation determine the product schedule of non bottleneck operations.

The important concept behind TOC is that the production rate of the entire factory is set at the pace of the bottleneck – the constraining resource. Hence, in order to achieve the best result TOC emphasises the importance of removing bottlenecks or limiting factor. If they cannot be removed they must be coupled with in the best to be drawn to identify the bottlenecks or binding constraints.

TOC identifies three types of cost.

- Throughput contribution = Sales revenue -- direct material cost.
(Direct material cost includes purchased components and materials handling costs.)
- Conversion costs : These are all operating costs, excluding completely variable costs, which are incurred in order to produce the product i.e. labour and overhead, including rent, utilities and relevant depreciation.
- Investments which include all stock, raw material, work in progress, finished goods, research and development costs, cost of equipment and buildings, etc.

The aim is to increase throughput contribution while decreasing conversion costs and investment costs.

10. Throughput accounting

Throughput Accounting (TA) is a method of performance measurement which relates production and other costs to throughput. Throughput accounting product costs relate to usage of key resources by various products.

It assumes that a manager has a given set of resources available. These comprise the existing buildings, capital equipment and labour force. Using these resources, purchased materials and components must be processed to generated sales revenue. To achieve this, maximum amount of throughput is required with the financial definition.

$$\text{Sales revenue} - \text{Direct materials cost}$$

The cost of all other is deemed at least time related rather than fixed.

Throughput is influenced by :

- Selling price
- Direct purchase price
- Usage of direct materials
- Volume of throughput.

Constraints on throughput might include :

- the existence of an uncompetitive selling price
- the need to deliver on time to particular customers
- the lack of product quality and reliability
- the lack of reliable materials suppliers
- the existence of shortage of production resources.

It becomes management's task to eliminate these constraints. Shortage of resources are usually termed bottlenecks, and their elimination often only moves a problem from one location to another. Thus the careful planning to minimize and eliminate all bottlenecks becomes very important.

11. Limitations of Budgetary Control System

Budgets may or may not be true, as they are based on estimates.

1. Budgets are considered as rigid document.
2. Budgets cannot be executed automatically

3. staff co – operation is usually not available during budgetary control exercise
4. Its implementation is quite expensive.

12. Fixed Budget

According to Chartered Institute of Management Accountants of England, “a fixed budget, is a budget designed to remain unchanged irrespective of the level of activity actually attained”. Fixed Budget is used as an effective toll of control. In case, the level of activity attained is different from the level of activity for budgeting purposes, the fixed budget becomes ineffective. Such a budget is quite suitable for fixed expenses.

13. Flexible budget

A budget which, by recognizing the difference in behaviour between fixed and variable costs, in relation to fluctuations in output, turnover, or other variable factors such as number of employees, is designed to change appropriately with such fluctuations. Flexible budget is designed to change in accordance with the level of activity actually attained. This budget is prepared in such a manner so as to present budget cost for different levels of activity. It is more realistic and practicable because it gives due consideration to cost behaviour at different levels of activity. While preparing a flexible budget the expenses are classified into three categories viz.

- (i) Fixed (ii) Variable, and (iii) Semi - variable

14. Distinction between Fixed and Flexible Budget

Fixed Budget	Flexible Budget
1. It does not change with actual volume of activity achieved. This it is known as rigid	It can be recasted on the basis of activity level to be achieved. Thus it is not rigid.
2. It operates on one level of activity and under one set of conditions. It assumes that there Will be no change in the prevailing conditions Which is unrealistic.	It consists of various budgets for different levels of activity.
3. Here as all costs like – fixed, variable and semi – variable are related to only one level of activity so variance analysis Does not give useful information.	Here analysis of variance provide useful information as each cost is analyzed according to its behaviour.
4. If the budgeted and actual activity levels differ significantly, then the aspects like cost ascertainment and price fixation do not give a correct picture	Flexible budgeting at different levels of activity, facilitates the ascertainment of cost, fixation of selling price and tendering of quotations.
5. Comparison of actual performance with budgeted targets will be meaningless specially when there is a difference Between the two activity levels.	it provides a meaningful basis of comparison of the actual performance with the budgeted targets.

15. The Balanced Scorecard (for problems ref Pg. No 61)

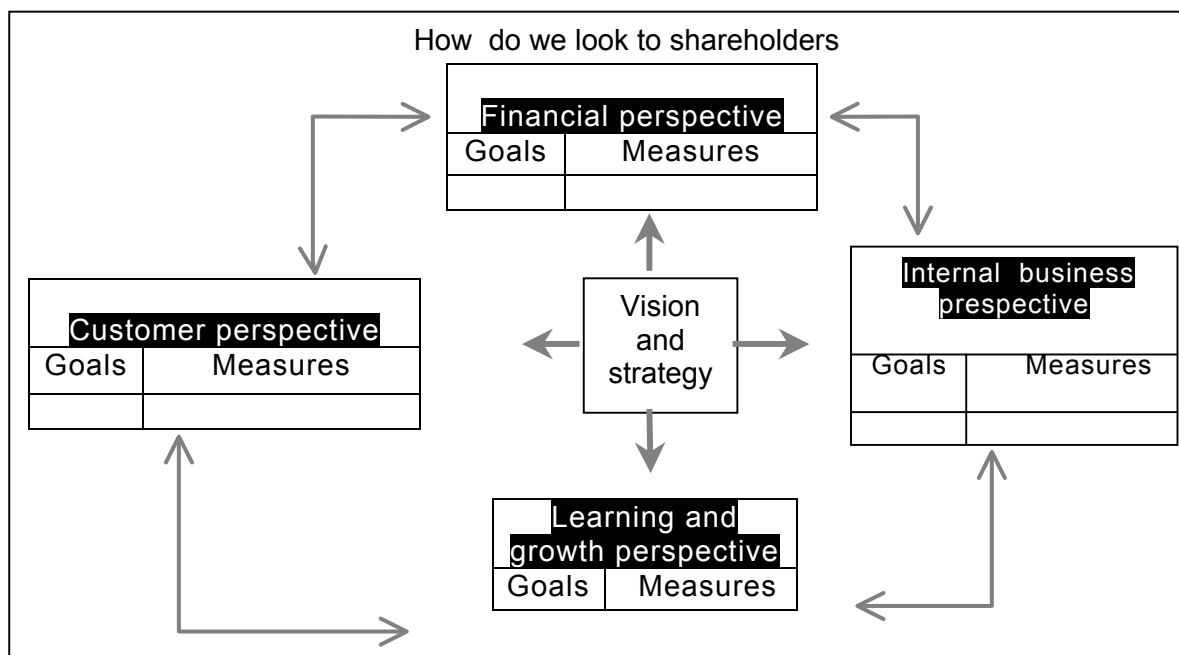
Prior to the 1980s management accounting control systems tended to focus mainly on financial measures of performance. The inclusion of only those items that could be expressed in monetary terms motivated managers to focus excessively on cost reduction and ignore other important variables like product quality, delivery, reliability, after-sales service and customer satisfaction. These became key competitive variables, but not of these were measured by the traditional management accounting performance measurement system.

The **Balanced scorecard** helps top management evaluate whether lower – level managers have improved one area at the expense of others. For example, a manager at risk of not meeting operating profit goals may start to ship high – margin products and delay deliveries of low – margin products. The balanced scorecard will recognize the improvement in financial performance but will also reveal that operating profit targets were achieved by sacrificing on – time performance. Four perspectives are typically integrated in a balanced scorecard :

1. *Customer perspective*: The balance scorecard builds on established competitive strategies, such as customer orientation, short response times, total quality and teamwork. Many organizations already see themselves as customer oriented. However, the customer perspective of the balanced scorecard requires customers themselves to identify a set of goals and measures on factors which really matter to them. Performance measures such as time, cost, quality, performance and service should be developed by groups of managers working with customers to understand their primary requirements.
2. *Internal perspective*: The organisation must excel at certain internal processes, decisions and actions if it is to meet these customer requirements. The internal perspective must reflect the organization's core skills and the critical technology involved in adding value to the customer's business. The organization's overall goals have to be broken down into unit, departmental or workgroup measures which are influenced by employee actions. Clearly, this is a part of the same movement towards business processes which is being followed by activity – based costing and activity – based management.
3. *Innovation & learning*: So far, the customer and internal perspectives will have focused on the organization's current competitive position. The innovation and learning perspective is required in order to recognize that this is constantly seek to learn, to innovate and to improve every aspect of the organisation and its business just to maintain their competitive situation, let alone to improve in the future.
4. *Financial perspective*: The financial perspective covers traditional measures such as growth, profitability and shareholder value but are set through talking to the shareholders(s) direct. The customer, internal and innovation and learning perspectives, if correctly implement4ed, will not automatically result in financial improvement if the overall corporate strategy is not a fundamentally profitable one. The financial perspective looks at whether is resulting in bottom line financial improvement.

Only by combining, measuring and thinking in terms of all four perspectives can managers prevent improvements being made in one area at the expenses of another. The balanced scorecard forces managers to think in terms of those fundamental competitive issues which impact upon long – term, rather than short – term, profitability.

The Balance Scorecard



Problems : Bottleneck , Throughput & Theory of Constraints

1. The particulars are extracted from the books of Raj company:-

	Product A	Product B
	Per unit	per unit
Sales	Rs. 100	Rs. 120
Consumption of material:	2 Kg	3 Kg
Material Cost	Rs.10	Rs. 15
Direct wages cost	Rs.15	Rs. 10
Direct expenses	Rs. 5	Rs. 6
Machine Hours used	3	2
Overhead expenses :		
Fixed	Rs. 5	Rs. 10
Variable	Rs. 15	Rs. 20

Direct wages per hour is Rs. 5/- Comment on profitability of each product (both use the same raw material) when

- Total sales potential is limited;
- Raw Material is in short supply;
- Production capacity (in terms of machine hours) is the limiting factor.

b) Assuming Raw Material as the key factor, availability of which is 10,000 Kg. and maximum sales potential of each product being 3,500 units, prepare Production Budget.

2. A company manufactures two products. Each product passes through two departments A and B before it becomes a finished product. The data for a year are as under:

Products	Aristocrat	Deluxe
(i) Maximum sales Potential in units	7,400	10,000
(ii) Product unit data :		
Selling price per unit	Rs. 90	Rs. 80
Machine hours per unit :		
Department A hours	0.50	0.30
Department B hours	0.40	0.45

- (iii) Maximum capacity of Department A is 3,400 hours and of Department B is 3,840 hours
 (iv) Maximum quantity of direct materials available is 17,000 kg. each product requires 2 kg. of direct materials. The purchase price of the direct materials is Rs. 5 kg.

- a. You are required to find the optimum product mix.
 b. In view of the aforesaid production capacity constraints, the company has decided to produce only one of the two products during the year under review. Which of the two products should be produced and sold in the year under review to maximize the profit. State the number of units of that product and the resultant contribution.
 c. find the optimum product mix & profit under TOC.

3. A company produces 3 products A, B and C. The following information is available for a period.

Production	A	B	C
Contribution (Sales – Direct Materials)	Rs. 24	Rs. 20	Rs. 12
Machine hours required per unit:			
Machine 1	12	4	2
Machine 2	18	6	3
Machine 3	6	2	1
Estimated sales demand	200	200	200

It is given that machine capacity is limited to 3,200 hours for each machine, you are required to analyze the above information and apply TOC process to remove the constraint.

4. The following data is to be used to answer questions (a), (b) and (c) below.
 HG plc manufactures four products. The unit cost, selling price and bottleneck resource details per unit are as follows:

	Product W Rs.	Product X Rs.	Product Y Rs.	Product Z Rs.
Selling price	56	67	89	96
Materials	22	31	38	46
Labour	15	20	18	24
Variable overhead	12	15	18	15
Fixed overhead	4	2	8	7
	Minutes	Minutes	Minutes	Minutes
Bottleneck resource time	10	10	15	15

- (a) Assuming the labour is a unit variable cost, if the products are ranked according to their contribution, the most profitable product is

(A) W (B) X (C) Y (D) Z

- (b) Assuming that labour is a unit variable cost, if budgeted unit sales are in the ratio W:2; X:3; Y:3; Z:4 and monthly fixed costs are budgeted to be Rs. 15,000, the number of units of W that would be sold at the budgeted breakeven point is nearest to

(A) 106 units (B) 142 units. (C) 212 units (D) 283 units

- (c) If the company adopted throughput accounting and the products were ranked according to 'product return per minute', the highest ranked product would be

(A) W (B) X (C) Y (D) Z

5. Flopro plc make and sell two products A and B, each of which passes through the same automated production operations. The following estimated information is available for period 1

- | | | | |
|-----|--|------|------|
| (i) | Product unit data: | A | B |
| | Direct material cost (Rs.) | 2 | 40 |
| | Variable production overhead cost (Rs) | 28 | 4 |
| | Overall hours per product unit (hrs) | 0.25 | 0.15 |
- (ii) Production/ sales of products A and B are 1,20,000 units and 45,000 units respectively. The selling prices per unit for A and B are Rs. 60 and Rs. 70 respectively.
- (iii) Maximum demand for each product is 20% above the estimated sales levels.
- (iv) total fixed production overhead cost is Rs. 14,70,000. This is absorbed by products A and B at an average rate per hour based on the estimated production levels.

Required:

- (a) Using net profit as the decision measure, show why the management of Flopro plc argues that it is indifferent on financial grounds as to the mix of products A and B which should be produced and sold and calculate the total net profit for period 1
- (b) One of the production operations has a maximum capacity of 3,075 hours which has been identified as a bottleneck which limits the overall production/ sales of products A and B. the bottleneck hours required per product unit for product A and B are 0.02 and 0.015 respectively.
All other information detailed in (a) still applies.

Required: Calculate the mix (units) of products A and B which will maximize net profit and the value (Rs.) of the maximum net profit.

- (c) The bottleneck situation detailed in (b) still applies. Flopro plc has decided to determine the profit maximizing mix of products A and B based on the throughput Accounting principle of maximizing the throughput return per production hour of the bottleneck resource. This may be measured as:

$$\text{Throughput return per production hour} = \frac{\text{selling price} - \text{material cost}}{\text{Bottleneck hours per unit}}$$

All other information detailed in (a) and (b) still applies, except that the variable overhead cost as per (a) is now considered to be fixed for the short / intermediate term, based on the value (Rs.) which applied to the product mix in (a).

Required:

- (i) Calculate the mix (units) of products A and B which will maximize net profit and the value of that net profit.
- (ii) Calculate the throughput accounting ratio for product B which is calculated as:
- $$\frac{\text{Throughput return per hour of bottleneck resource for product B}}{\text{Overall total overhead cost per hour of bottleneck resource.}}$$
- (iii) Comment on the interpretation of throughput accounting ratios and their use as a control device. You should refer to the ratio for Product B in your answer.
- (iv) It is estimated that the direct material cost per unit of product B may increase by 20% due to shortage of supply.

Calculate the revised throughput accounting ratio for product B and comment on it.

Functional Budgets

6. A single product company estimated its sales for the next year quarter wise as under :

Quarter	Sales Units
I	30,000
II	37,500
III	41,250
IV	45,000

The opening stock of finished goods is 10,000 units and the company expects to maintain the closing stock of finished goods at 16,250 units at the end of the year. The production pattern in each quarter is based on 80% of the sales of the current quarter and 20% of the sales of the next quarter.

The opening stock of raw materials in the beginning of the year is 10,000 Kg. And the closing stock at the end of the year is required to be maintained of 5,000 kg. Each unit of finished output requires 2 Kg. of raw materials.

The company proposes to purchase the entire annual requirement of raw materials in the first three quarters in the proportion and at the price given below :

Quarter	Purchase of raw materials % to total Annual requirement in equity	Price per kg. Rs.
I	30%	2
II	50%	3
III	20%	4

The value of the opening stock of raw materials in the beginning of the year is Rs.20,000. You are required to present the following for the next year, quarter-wise :

- (i) Production budget in units.
- (ii) Raw material consumption budget in quantity.
- (iii) Raw material purchase budget in quantity and value.
- (iv) Priced stores ledger card of the raw material using FIFO.

7. Soloproducts Ltd. manufactures and sells a single product and has estimated a sales revenue of Rs.126 lakhs this year based on a 20 per cent profit on selling price. Each unit of the product requires 3 lbs of material P and 1 ½ lbs of material Q for manufacture as well as a processing time of 7 hours in the Machine shop and 2 ½ hours in the Assembly Section. Overheads are absorbed at a blanket rate of 33.3333% of 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 past performance (in Hours) of factory in last 3 yrs-

	<u>Machine Shop</u>	<u>Assembly shop</u>
In 2003	11,00,000	3,45,000
In 2004	10,30,000	3,20,000
In 2005	10,80,000	3,40,000

The other details are as under :	Rs.
Purchase price Material P	6 per lb
Material Q	4 per lb

Management Accountancy**Cost Management-24**

Comprehensive Labour Rate		Machine Shop	4 per hour	
		Assembly	3.20 per hour	
No. of Employees	Machine Shop	600		
	Assembly	180		
		<u>Finished Goods</u>	<u>Material P</u>	<u>Material Q</u>
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 :

- The number of units of the product proposed to be sold.
- Purchases to be made of Materials P and Q during the year in Rupees.
- Capacity utilisation of Machine shop and Assembly Section, along with your comments.

8. P. H. Ltd. has specialised in the manufacture of three kinds of sub-assemblies required by the manufacturers of certain equipments. The current pattern of sales of sub-assemblies is in the ratio (in units) of 1 : 2 : 4 for sub-assemblies P, Q and R respectively.

The sub-assemblies consist of the following components:

Sub-assembly	Selling price Rs.p.u.	Requirement of components on per unit basis.			
		Frame	Part X	Part Y	Part Z
P	430	1	10	2	8
Q	500	1	2	14	10
R	600	1	6	10	2
Purchase Price (Rs.)		40	16	10	6

The direct labour hours required per unit for the manufacture of each of the sub-assemblies are:

Sub-assembly	Skilled Hours	Un-Skilled Hours
P	4	4
Q	3	4
R	3	6
Wage rate per hour (Rs.)	6	5

The labourers work for 8 hours a day for 25 days a month. Variable overheads per sub-assembly are P Rs. 10, Q Rs. 8 R Rs. 7. The estimates of 'opening stock of sub-assemblies and components for the month of July 2006 are as under:

Sub-assemblies		Components	
P	600	Frames	2000
Q	1400	Part X	800
R	3200	Y	20000
		Z	8000

Fixed overheads budget per month is an under:

	Rs.
Production	15,80,000
Selling & Distribution	7,28,000
Administration	6,76,000

All fixed overheads are incurred evenly throughout the year. The target of profit for the current year is Rs. 120 lakhs before tax. The company has to plan to reduce the closing stock of sub-assemblies and components by 10 % as compared to the opening stock.

Prepare the following budgets for July 2006:

- (i) Sales in quantities and value
- (ii) Production in quantities
- (iii) Material usage
- (iv) Material purchase in quantities and value
- (v) Manpower budget for both categories of labour including wages payable.

9. Manufacturers Ltd. produce three products from three basic raw materials in three departments. The company operates a budgetary control system and values its stock of finished goods on a total cost basis. From the following data, you are required to produce for the month of July 1986 the following budgets:-

- a) Production
- b) Materials usage
- c) Purchases
- d) Profit and Loss Account for each product and in total

Budgeted data for July 2007			
Product	A	B	C
Sales	Rs. 15,00,000	Rs. 10,80,000	Rs. 16,80,000
Stock of finished products at July 1 st , 2007 in units	3,000	2,000	2,500
Department	I	II	III
Production overhead	Rs. 2,39,000	Rs. 2,01,300	Rs. 3,91,200
Direct Labour hours	47,800	67,100	65,200
Direct Material	M ₁	M ₂	M ₃
Stock at July 1 st 2007(units)	24,500	20,500	17,500

The company is introducing a new system of inventory control which should reduce stocks. The forecast is that stocks as at 31st July 2007 will be reduced as follows: Raw materials by 10% and finished products by 20%.

Fixed production overhead is absorbed on a direct labour hour basis. It is expected that there will be no work-in-progress at the beginning or end of the month. Administration cost is absorbed by product at a rate of 20% of production cost and selling and distribution cost is absorbed by products at a rate of 40% of production cost. Profit is budgeted as a percentage of total cost as follows:

Product A 25%, Product B 12 1/2% and Products C 16 2/3%.

Standard cost data, Per unit of Product :—

Product	Price p.u.	A	B	C
Direct Material :	Rs.	units	units	units
M ₁	2.00	5	—	12
M ₂	4.00	—	10	9
M ₃	1.00	5	5	—
Direct Wages(Rate per hour) :	Rs.	Hours	Hours	Hours
Department I	2.50	4	2	2
Department II	2.00	6	2	3
Department III	1.50	2	4	6
		Rs.	Rs.	Rs.
Other Variable costs		10	20	15

May -1986

10. ACE Ltd. manufactures three products, A, C and E in two production departments, F and G in each of which are employed two grades of labour. The cost accountant is preparing the annual budgets for the next year and he has asked you to prepare, using the data given below: -

- (a) The production budget in units for products A, C and E.
- (b) The direct wages budget for departments F and G with the labour costs of products A,C and E and total shown separately Rs .(000).

	Product A	product C	product E
Finished stocks:			
Budgeted stocks are			
1 st January – next year	720	540	1,800
31 st December – next year	600	570	1,000
All stocks are valued at standard cost p.u.	Rs. 24	Rs. 15	Rs. 20
Standard profit: Calculated % of selling price:	20%	25%	16-2/3%

Budgeted sales are: Total Rs,000	Product A	product C	product E
South	6,600	1,200	1,800
West	5,100	1,500	1,200
North	<u>6,380</u>	<u>1,500</u>	<u>800</u>
	<u>18,080</u>	<u>4,200</u>	<u>3,800</u>
Normal loss in production	10%	20%	5%

Standard Labour times per unit and standard rates per hour:

	Rate Rs.	product A Hours per Unit	product C hours per unit	product E hours per unit
Department F:				
Grade 1	1.80	2.0	3.0	1.0
Grade 2	1.60	1.5	2.0	1.5
Department G:				
Grade 1	2.0	3.0	1.0	1.0
Grade 2	1.80	2.0	1.5	2.5

Selling Expenditure Budget

11. Pharma Ltd. sells Ayurvedic medicinal products through direct orders booked by salesman when they call on potential buyers and also through mail orders which arise out of sales campaign by salesman. The company pays the salesman an incentive commission on the following basis:

5% of sales on orders booked by them directly;
 2% of sales on mail order sales in the territory of the particular salesman.
 Dispatch and billing expenses amount to 5% of sales revenue on all orders.

The sales budget for the coming year indicates the following mix:

Quarter	Total sales Rs.	Direct booking by salesman (%)	Mail order sales (%)
1	10, 00,000	80	20
2	12, 00,000	70	30
3	13, 00,000	75	25
4	15, 00,000	80	20

Fixed selling expenses for the budget year:

Sales salaries	1, 00,000
Advertising	1, 50,000
Travelling expenses	80,000

Sales salaries and traveling are paid uniformly in each quarter. The advertisement expenses are Incurred as under: 1st quarter-10%; 2nd quarter-50%; 3rdquarter-30%, 4th quarter-10%.

Required

- a. Prepare a Quarterly Budget of selling expenses for the year
- b. It has been observed that 50% increase in Budgeted advertisement expenditure will double the quarter quantities of mail order sales .Although it would be at the cost of direct sales, it would also reduce travelling expenditure by 25%.However rates of commission to salesman would remain unaffected.

Compute the effect of the proposal and suggest whether the same acceptable.

Cash Budget

12. The 1st January cash balance of the Jay Company is Rs. 5,000 . Sales for the first four months of the year are expected to be as follows : January, Rs. 65,000; February, Rs. 54,000; March, Rs. 66,000; and April, Rs. 63,000.

On January1, uncollected amounts for November and December of the previous year, are Rs. 13,500 and Rs. 39,150, respectively. Collections from customers follow this pattern; 55% in the month of sale, 30% in the month following the sale, 13% in the second month following the sale, and 2% un-collectible.

Materials purchases for December were Rs. 10,000. Forecast purchases for the coming year are January, Rs. 12,500; February, Rs. 16,500; March, Rs. 13,000; and April, Rs. 14,000. Purchases are usually paid by the 10th of the month following the month of purchase . Other cash expenditures of Rs. 41,000 are forecast for each month.

Calculate :

- (i) Expected cash collections during February
- (ii) Expected cash balance, February 1
- (iii) Expected cash balance, February 28.

13. Prepare cash budget for July - December from the following information :

- (I) The estimated sales, expenses etc. are as follows :

	June	July	Aug.	(Rs. in lacks)				Dec.
	Sept.	Oct.	Nov.					
Sales	34	40	40	50	50	60		65
Purchase	24	16	17	20	20	25		28
Wages and Salaries	12	14	14	18	18	20		22
Miscellaneous	5	6	6	6	7	7		7
Interest Received	2	--	--	2	--	--		2
Sales of Shares	--	--	20	--	--	--		--

- (ii) 20% of the sales are on cash with 3% cash discount and the balance on credit.
- (iii) 1% of the credit sales are returned by the customers. 2% of the net receivable constituted bad debt losses. 50% of the good accounts receivable are collected in the month following the sales with 1% cash discount, 30% of the good accounts receivable are collected in the 2nd month following the sales and the rest in the 3rd month following sales.
- (iv) The time lag in the payment of misc. expenses and purchases is one month. Wages and salaries are paid fortnightly with a time lag of 15 days.

- (i) The company keeps a minimum cash balance of Rs. 25.00 lakhs. Cash in excess of Rs. 27 lakhs is invested in 9% Govt. securities in the multiple of Rs. 1 lakh. Interest is receivable on monthly basis. Shortfalls in the minimum cash balance are made good by borrowings from banks in multiple of Rs.2 lakhs & also repaid by same amount. The rate of interest is 12% p.a. (compound interest)
- (ii) The opening cash balance is Rs.26 lacks
- (iii) Sales in the month April & May was Rs. 44 & 40 lacks. Respectively.

14. On 30th September, 2007, the Balance Sheet of Melodies Pvt. Ltd. retailers of musical instruments, was as under:

	Rs.		Rs.	Rs.
Ordinary Shares @ Rs.10	20,000	Equipment (at cost)	20,000	
Reserves and Surplus	10,000	Less: Depreciation	<u>5,000</u>	15,000
Trade Creditors	40,000	Stock		20,000
Proposed Dividend	15,000	Trade Debtors		15,000
		Balance at Bank		<u>35,000</u>
	<u>85,000</u>			<u>85,000</u>

The company is developing a system of forward planning and on 1st October 2007 it supplies the following information:-

Month	Credit Sales Rs.	Cash Sales Rs.	Credit Purchases Rs.
September 2007 (actual)	15,000	14,000	40,000
October 2007 (budget)	18,000	5,000	23,000
November 2007 (budget)	20,000	6,000	27,000
December 2007 (budget)	25,000	8,000	26,000

All trade debtors are allowed one month's credit and are expected to settle promptly. All trade creditors are paid in the month following delivery.

On 1st October 2007, all the equipment was replaced at a cost of Rs. 30,000. Rs. 14,000 was allowed in exchange for the old equipment and a net payment of Rs. 16,000 was made. Depreciation is to be provided at the rate of 10% per annum.

The proposed dividend will be paid in December 2007. The following expenses will be paid :

Wage Rs. 3,000 per month

Administration Rs. 1,500 per month

Rent Rs. 3,600 for the year to 30th Sep. 2008 (to be paid in October 2007)

Nov 1990 Q-5

Budget Ratios:

- Efficiency Ratio = (Standard hours ÷ Actual hours) × 100**
- Activity Ratio = (Standard hours ÷ Budgeted hours) × 100**
- Calendar Ratio = (Available working days ÷ budgeted working days) × 100**
- Standard Capacity Usage Ratio =
(Budgeted hours ÷ Max. possible hours in the budgeted period) × 100**
- Actual Capacity Usage Ratio =
(Actual hours worked ÷ Maximum possible working hours in a period) × 100**

6. **Actual Usage of Budgeted Capacity Ratio =**

$$(\text{Actual working hours} \div \text{Budgeted hours}) \times 100$$

15. Following data is available for T.T.D and Co:

Standard working hours	8 hours per day of 5 days per week
Maximum capacity	50 employees
Actual working	40 employees
Actual hours expected to be worked per four week	6,400 hours
Std. hours expected to be earned per four weeks	8,000 hours
Actual hours worked in the four week period	6,000 hours
Standard hours earned in the four week period	7,000 hours.

The related period is of 4 weeks. In this period there was a one special holiday due to national event. Calculate the following ratios :

(1) Efficiency Ratio, (2) Activity Ratio, (3) Calendar Ratio, (4) Standard Capacity Usage Ratio, (5) Actual Capacity Usage Ratio. (6) Actual Usage of Budgeted Capacity Ratio.

Problems on Fixed & Flexible Budget & Performance Analysis

16. The budgeted level of activity of a production department of a manufacturing company is 5,000 hours in a period. But a technical study assumes overhead behaviour mentioned below :-

	<u>Rs(00) Per hr.</u>	<u>Total in Rs(000).</u>	
Indirect wages, variable cost,	0.40		
Rent and Tax, fixed cost		320	
Consumable supplies, variable	0.24		
Repairs : up to 2,000 hours		100	
additional each extra 500 hrs up to 4,000 hrs.		35	P.T.O
additional 4,001 to 5,000 hrs		60	
additional, above 5,000 hrs		70	
Supervision up to 2,500 hrs		400	
additional each extra 600 hrs up to 4,900 hrs		100	
additional, above 4,900 hrs		150	
Power variable up to 3,600 hrs	0.25		
for hrs above 3,600 additional cost,	0.20		
Depreciation up to 5,000 hrs		650	
above 5,000 hrs.		820	
Clearing up to 4,000 hrs		60	
above 4,000 hrs		80	
Lighting 2,100 to 3,500 hrs		120	
3,501 hrs to 5,000 hrs		150	
above 5,000 hrs		175	

- (a) Prepare fixed budget and a flexible budget at 70%, 85% and 110% of budgeted level of activity in one statement.
 (b) Calculate a departmental hourly rate of overhead absorption.

17. The budgets for XYZ Ltd. for the first three quarters of operation are shown below :

Period Covered	Budgets Quarters I – III			Rs.(000)
	Q – I	Q – II	Q – III	
<u>Activity :</u>				
Sales (Units)	9	17	15	
Production (Units)	10	20	15	
<u>Costs (Rs.) :</u>				
Direct Material				
A	60	120	90	
B	50	100	75	
Production Labour	180	285	230	
Manufacturing Overheads (Excluding Depreciation)	90	120	105	
Depreciation of Production Machinery	20	20	20	
Administration Expenses	25	25	25	
Selling & Distribution Expenses	38	54	50	

The figures shown above represent the costs structure of XYZ Ltd., which have the following major features :

Fixed element of any cost is completely independent of activity levels.

- (ii) Any variable element of each cost displays a linear relationship with activity level, except that the variable labour cost become 50% higher for activity in excess of 19,000 units per quarter due to the necessity for overtime working.
- (iii) The variable element of selling and distribution expenses is a function of sales. All other costs with a variable element are a function of production volume.

Activity for each quarter is spread evenly throughout that quarter. In Quarter IV Production level will be set equal to sales level. Production and sales in this quarter is expected to range between 15,000 units and 21,000 units. The most likely volume is 18,000 units. In month 9 it will be possible to accurately estimate the sales for Quarter IV.

Cost structure will remain the same as in Quarters I to III except the following :

- (i) Labour wage rate will rise by 12½%.
- (ii) Variable labour input per unit of output will decrease, due to learning curve effect, such that 80% of the previous labour input per unit of output will be required in Quarter IV. The threshold for overtime working remains at 19,000 units per quarter.
- (iii) Fixed factory overheads and the fixed element of selling and distribution costs will each rise by 20% (The variable element of selling and distribution costs will be unaltered.)

Required :

- (i) Prepare a Statement to show, under each cost classification given in the budgets, the variable cost per unit and fixed costs which will be effective in Quarter IV.
- (ii) Prepare a flexible budget of production costs for the Quarter IV. (May '95 Q:4b)

18. The following are the details of the Budgeted and the actual cost in a factory for six months from January to June, 2005. From the figures given below you are required to prepare the production cost budget for the period from January to June, 2006.

	January - June, 2005	
	<u>Budget</u>	<u>Actual</u>
Production (units)	20,000	18,000
	Rs.	Rs.
Material cost	40,00,000	39,90,000
	(2,000 MT @ Rs. 2,000)	(1,900 MT @ Rs. 2,100)
Labour cost	8,00,000 (@ Rs. 20 per hour)	7,99,920 (@ Rs. 22 per hour)
Variable overheads	2,40,000	2,16,000
Fixed overheads	4,00,000	4,20,000

In the first half of 2006, production is budgeted for 25,000 units. Material cost per metric tonne will increase from last year's actually by Rs. 100 but is proposed to maintain the consumption efficiency of 2005 as budgeted. Labour efficiency will be lower by another 1% and labour rates will be Rs. 22 per hour. Variable and Fixed overheads will go up by 20% over 2005 actual.

You are required to prepare the production cost budget for the period January-June, 2006 giving all the workings. Also prepare a performance report for last year.

19. Plan for profit Ltd. Has the following Divisions: Marketing Manufacturing, Materials Management, Dispatch and Warehousing Research and Engineering, Finance and Secretarial, Personnel and General Administration.

All the seven divisional heads after many meetings amongst themselves and due deliberation submit through the Managing Director, for the consideration of the Board of Directors, the Budget for the year 1988, indicating therein a pre-tax profit for the year of Rs. 225 lakhs.

The Directors are not satisfied with the figure of profit shown in the Budget. They feel that the profit can be improved upon by at least 25% and ask the Divisional Heads to have another look at the budget as the budget for 1988 has been prepared simply on the 1987 basis.

Meanwhile, the Finance Manager finds that the profit figures shown in the budget has not taken into account the carry over effects of certain actions taken in 1987:-

- The effect of salaries and wages increase in total would be Rs. 5 lakhs, comprising Rs. 20,000 in each of the Marketing, Materials Management and Finance and Secretarial Divisions, Rs. 4 lakhs in manufacturing Division, Rs. 30,000 in Research and Engineering and Rs. 10,000 in personnel division.
- Machine tools reconditioning programme undertaken already would increase the profit by 4 lakhs.
- Sale price increase effected would add Rs. 3 lakhs to profit.
- Net impact of other actions would result in a saving of Rs. 4.5 lakhs. Actions taken in manufacturing, Engineering, personnel and General Administration contributed to cost saving of Rs. 4.7 lakhs, Rs. 20,000 and Rs. 2.1 lakhs respectively, while correspondingly cost increases resulted in Marketing, Materials Management, Dispatch and warehousing to the extent of Rs. 30,000 Rs. 2 lakhs and Rs. 20,000 respectively.

Scanning the indications of environmental changes in 1988, the Marketing Manager envisages a market demand which would increase the sales by Rs. 33 lakhs, out of which a third would be

clean profit. On the other hand, Materials Manger envisages an inevitable rise in material cost of Rs. 8 lakhs.

Even when these are incorporated, as the profit comes nowhere near the target set by the Board, the Managing Director in concurrence with the Divisional Heads draws out a Management Plan of Action to improve the profit.

- An increase in sales prices will result in a profit of Rs. 7 lakhs.
- A deeper market penetration to bring in an additional sale of Rs. 90 lakhs with a clean profit of a third.
- Reduction in material usage would save Rs. 5 lakhs.
- Improvement in manpower utilisation would bring in a saving of Rs. 5.5 lakhs.
- Expenditure towards additional sales promotion would be Rs. 1.5 lakhs & expenditure towards training in manufacturing Division would be Rs. 2 lakhs and in Marketing Rs. 50,000.
- Other actions taken in the Divisions would net a saving of Rs. 7 lakhs – Machinery to a tune of Rs. 35 lakhs (cash outgo Rs. 25 lakhs) would be installed and this will effect a saving of Rs. 7 lakhs in manufacturing operations, Rs. 60,000 in dispatch and Warehousing and Rs. 20,000 in Engineering while streamlining in Marketing, Finance and General Administration would increase the cost by Rs. 40,000, Rs. 20,000 and Rs. 20,00 respectively.

Keeping the pre-tax profit of Rs. 225 lakhs given in the Budget as the base, prepare:

- (a) A simple statement for the Directors detailing the improvement n profit, item wise, as aforesaid under the three heads – carry over effect of actions in 1987, environmental changes in 1988, and changes resulting from management action plan.
- (b) A profit impact summary by divisional accountability, item wise, under the three heads, to enable each Divisional Head to know his contribution or otherwise, towards, profit improvement, for which he is responsible.

Nov --1987

STANDARD COSTING

1. Distinction or differences between budgets and standard .

Answer: Basic differences between Standard Costing and Budgetary control are as follows :

- i. Standard costs are ascertained for material labour and overhead. Here the control of each element of cost is effected by comparing actual costs with standard costs of actual output. Whereas budgets are prepared for different functions like sales, production, capital assets etc. of business. Budgetary control here is concerned with the overall profitability and financial position of the business.
- ii. Range of standard costing is narrow as it is mainly confined to the control of production costs. But the range of budgeting is wider than that of standard costing. It in fact cover sales, capital and financial expenses as well.
- iii. Standard costing is confined to the projection of cost accounts only whereas budgetary control includes projection of financial accounts as well.
- iv. For exercising control, variances are computed in standard costing as well as budgetary control. But these variances are normally recorded in different cost accounts under standard costing whereas they are not revealed under budgets.
- v. Under standard various causes of variances in respect of each cost element can be analysed in minute detail and corrective action taken accordingly.

Whereas budgetary control system deals with total expenses and revenues based on estimates.

	<u>Budget</u>	<u>Standard</u>
<u>Scope :</u>		
(a)	It includes overall estimates related to functions or depts. And permits use for all wings of an organisation i.e. from sales to manufacturing.	(a) It is worked out for minute details of operations in relation to manufacturing and to a limited Extent in distribution.
(b)	It is related to executive functions of An organisation.	(b) It is frequently related to labour operations.
(c)	Budget are anticipated or expected cost means to be used for forecasting requirements of finance, labour, material etc.	(c) Standard costs are planned costs under specific assumed condition of production performance, capacity level and operation and can not be used for forecasting always.
<u>Objective ;</u>	It has equal emphasis on planning co-ordination And control functions of management.	It has greater emphasis on control function but can Be used as a basis for planning and co-ordination.
<u>Acceptance ;</u>	For control purpose of management, acceptance Is easier through executives participation in Establishment.	Establishment is based on scientific assessment and management authority. Acceptance, particularly Related to labour, is comprehensively more difficult.
<u>Review :</u>	It is frequently subjected to review based on changing Circumstances, to guide management operation.	Review is less frequent and a standard is more Static in relation to time.
<u>Variance Analysis :</u>	Usually involves a lesser degree of analysis On overall basis.	Analysis is detailed and casual relationship with Specific functions are established.

2. How are cost variances disposed off in a standard costing system ? Explain.

Answer : There is no unanimity of opinion among Cost Accountants regarding the disposition of variances. The following are commonly used methods for their disposition.

1. Transfer all variances to Profit and Loss Account. Under this method, stock of work-in-progress, finished stock and cost of sales are maintained at standard cost and variances arising are transferred to profit and loss account.
2. Distributing variances on pro-rata basis over the cost of sales, work-in-progress and finished goods stocks by using suitable basis.
3. Write off quantity variances to profit and loss account and spread price variance over to cost of sales, work-in-progress and finished goods. The reason behind apportioning price variance to inventories and cost of sales is that they represent costs although they are derived as variances.

3. Mention the causes that give rise to Labour rate variance.

Answer: *Causes for the occurrence of labour rate variance* : This variance arises due to the difference between standard labour hour rate specified and the actual labour hour rate paid. It is computed by multiplying the actual hours taken by workers on a job by the difference between the standard and actual wage rate per hour. Main causes which contribute for the occurrence of labour rate variance are as below :

- i. Increase in actual wage rate per hour paid to workers.
- ii. Use of wrong type of labour i.e. for a job requiring the use of non-skilled labour uses skilled labour. Since the wages of skilled labour are more than that of non-skilled labour therefore this increased wage rate per hour of skilled labour force accounts for the occurrence of labour rate variance.
- iii. Payment of special increments or allowances to workers.
- iv. Non—anticipated wage increase at the time of setting standards.
- v. Using a gang or mix different from that used for setting labour standard.
- vi. Resorting to excessive overtime.

4. Basic or Bogey standards : These standards are used only when they are likely to remain constant or unaltered over a long period. According to this standard, a base year is chosen for comparison purpose in the same way as statisticians use price indices. Since basic standards do not represent what should be attained in the present period, current standards should be prepared if basic standards are used. Basic standards are, however, well suited to businesses having a small range of products and long production runs.

Basic standards are set, on a long – term basis and are seldom revised. When basic standards are in use, variances are not calculated as the difference between standard and actual cost. Instead, the actual cost is expressed as a percentage of basic cost.

The current cost is also similarly expressed and the two percentages are compared to find out how much the actual cost has deviated from the current standard. The percentages are next compared with those of the previous periods to establish the trend of actual and current standard from basic cost.

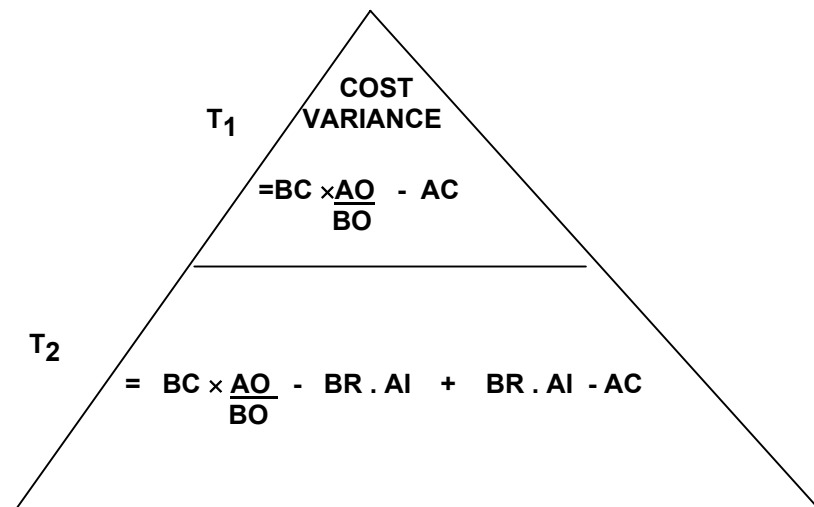
Rules for Variance Analysis

It is a technique of costing consisting of rules & procedure to ascertain the standard cost of products or services which are compared with the actual results to check the variations either for the purpose of a control measure or to revise it.

Types of variances :

1. Cost Variances .
2. Sales Variances .
3. Profit Variances .
4. Miscellaneous Variances .

GENERAL RULE FOR COST VARIANCE ANALYSIS:



Problems:

1. The following information is available from the records of Standcost Ltd. which follows the Partial Plan for accounting for standard costs, for October 2006 :-

		Rs.
Materials Purchased	: 10,000 pieces at Rs. 2.20 each	22,000
Materials Consumed	: 9,500 pieces at Rs. 2.20 each	20,900
Actual wages paid	: 2,480 hours at Rs. 2.50 per hour	6,200
Variable overhead incurred	:	3,000
Factory Overhead Incurred	:	11,000
Factory Overhead Budgeted	:	10,000

Units produced 900 units. These were sold at Rs. 50 per unit

Standard Rates and Price are :

Direct Material Rate	Rs. 2.00 per unit
Standard Input	10 pieces per unit
Direct Labour Rate	Rs. 2.00 per hour
Standard requirement	2.5 hours per unit
Variable overheads	Re.1 per hour
Fixed overheads	Rs. 4.00 per labour hour.

Required

- a) Show the Standard Cost Card.
- b) Compute Cost Variances for October 2006.
- c) Show the journal entries & ledger accounts ..

2. Gemini Enterprises manufactures product A. it uses a standard costing system in which material price variance and labour rate variance are segregated at the point of purchase of material and the incurrence of labour cost respectively.

The standard cost card for product A shows the following details:-

		Rs. Per unit
Material –	2 kgs at 3 per kg.	6
Labour –	5 hrs. at Rs. 2 per hr.	10
Overhead –	5 hrs. at Re 1 per hr.	5
Selling cost		<u>3</u>
Standard cost		<u>24</u>

Overhead rate is Re 1 per hour, the budgeted overhead being Rs. 2,000 for 2,000 budgeted hours. Other information for a month is as follows:-

Materials:

Opening stock	800 kgs. at Rs. 3 per kg.
Purchase	1,000 kgs. at Rs. 3.50 per kg.
Issued to production	900 kgs.

Direct labour:	1,850 hours at Rs. 2.20 per hour.
Overhead:	Rs. 2,100
Selling expenses	Rs.1,500

During this months, 360 units are completed and in respect of 40 units, it is estimated that they are complete as to materials, but half complete as to labour and overhead. 300 units are sold at Rs. 30 per unit during the month. Prepare:-

- Cost Control Accounts
- Variance Accounts
- Trial Balance at the end of the month.

May 1991

3. Goodwill Ltd. manufactures readymade shirts of a specific quantity in lots to each special order from its overseas customers.

The standard costs for one dozen of shirts are:	Rs.
Direct material (24 meters @ Rs. 11)	264
Direct labour (3 hours @ Rs. 49)	147
Overheads (3 hours @ Rs. 40)	<u>120</u>
Standard cost per dozen	<u>531</u>

During July, 2006 it worked on three order, for which the month's job cost records show :

Lot No.	Units	Materials used	Hours worked
45 (UK)	1,700 Doz.	40,440 Metres	5,130
46 (US)	1,200 Doz.	28,825 Metres	2,890
47 (CAN)	1,000 Doz.	24,100 Metres	2,980

Additional information :

- The company bought 95,000 meters of materials during July at a cost of Rs. 10,64,000. The material price variance is recorded when materials are purchased. All inventories are carried at cost.
- Direct labour during July amounted to Rs. 5,50,000. the employees were paid at Rs. 50 per hour.
- Overheads during the month amounted to Rs. 4,56,000.

A total of Rs. 57,60,000 was budgeted for overheads for the year 2006-07 , based on estimated production of the plant's normal capacity of 48,000 dozen shirts annually. Overheads at the level of production is 40% fixed and 60% variable. Overheads is applied on the basis of direct labour hours.

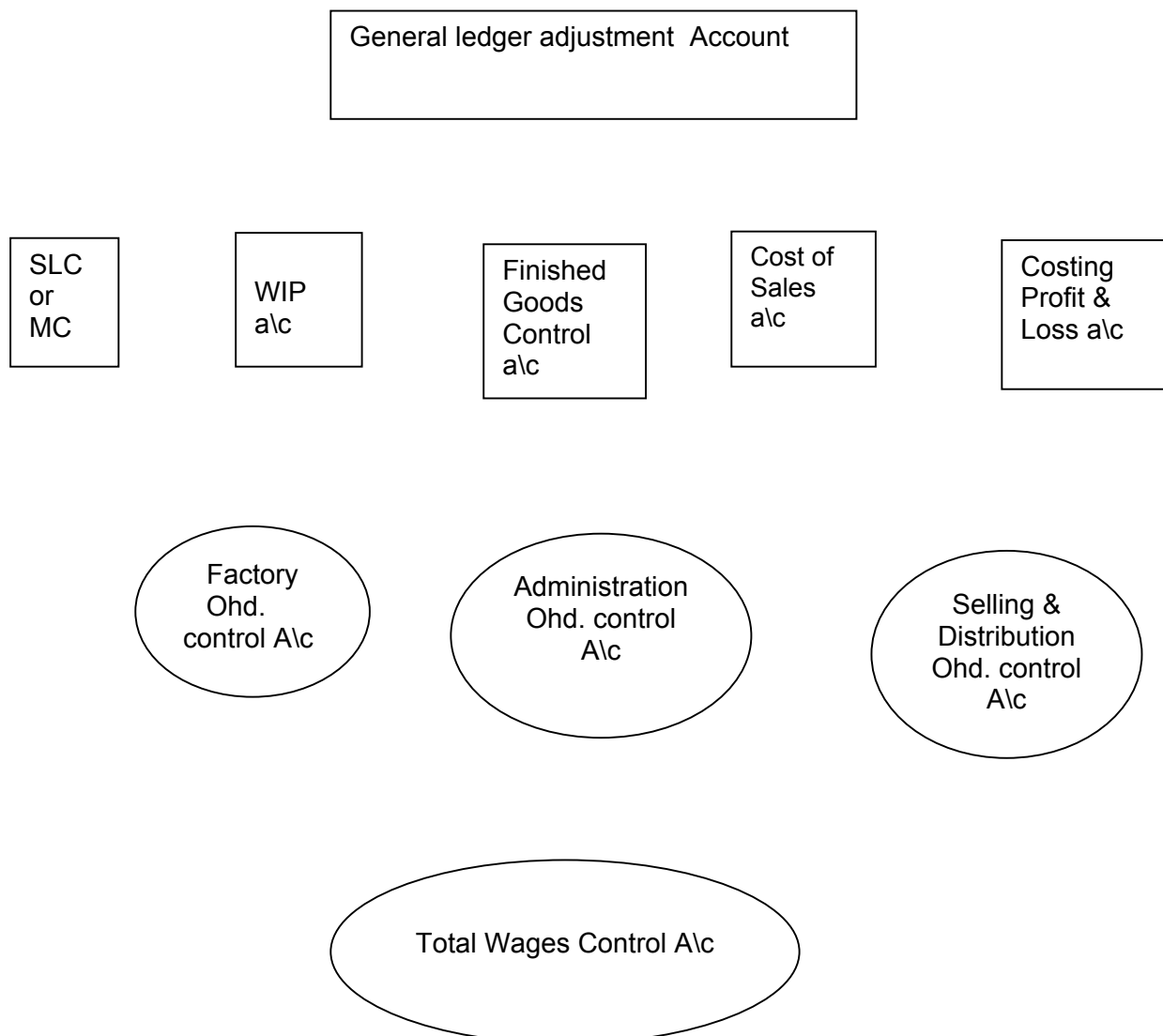
There was no work in progress at the beginning of July. During July, lot nos. 45 and 47 were completed. All materials were issued for lot no. 46 which was 80% complete as regards conversion.

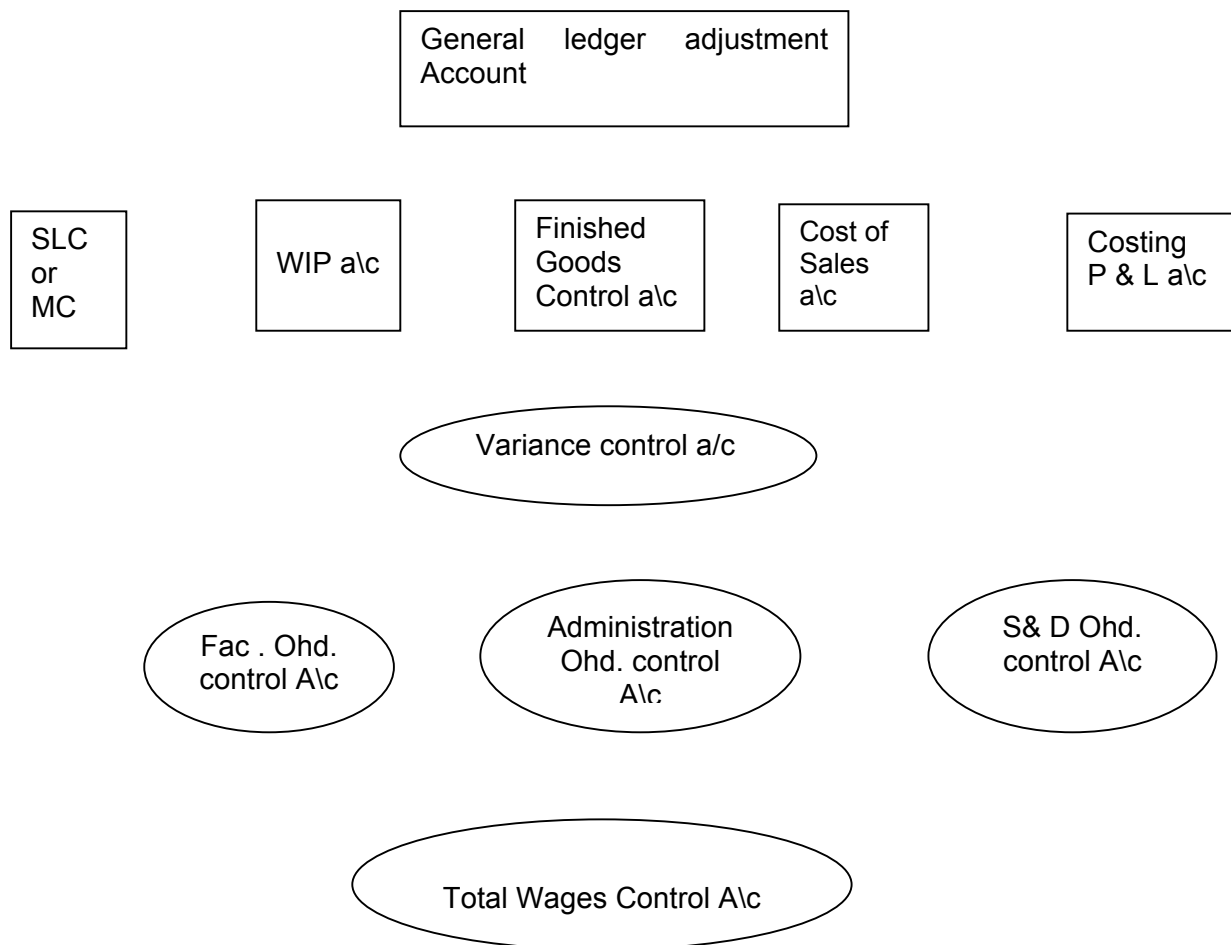
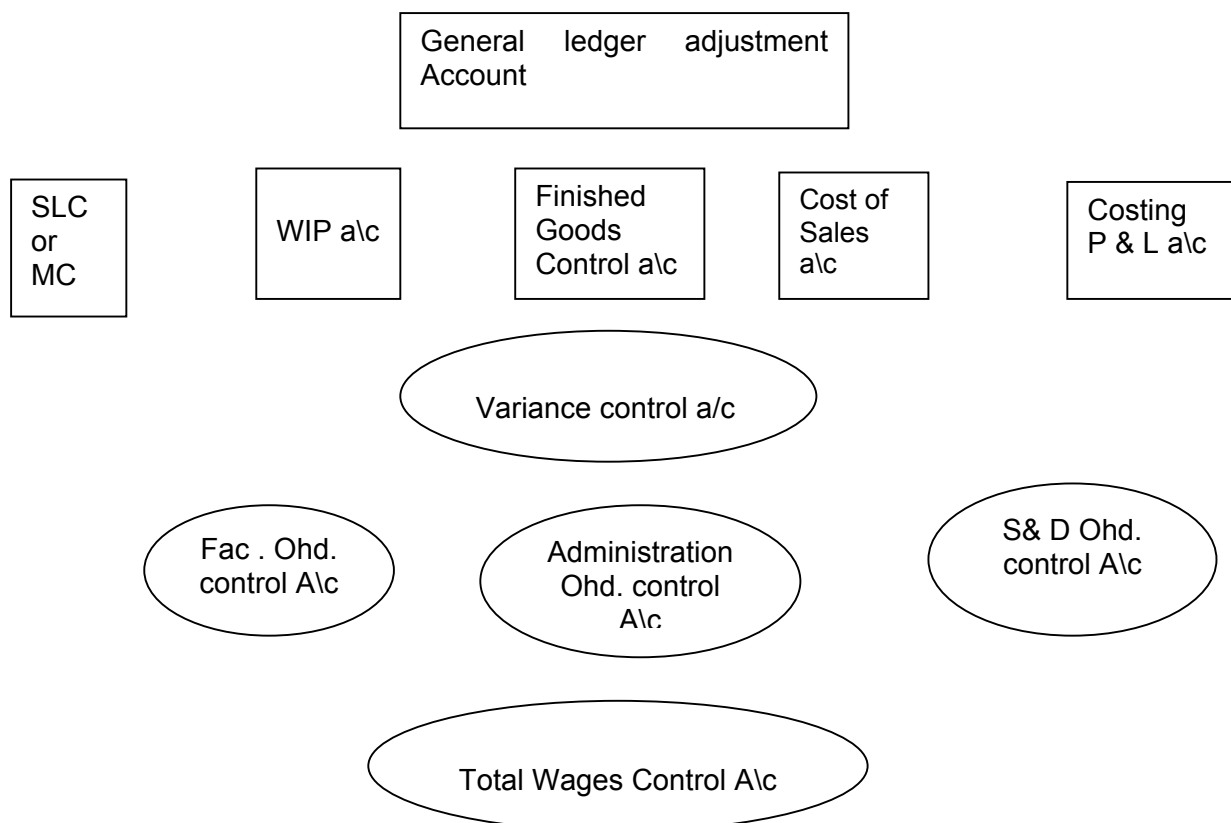
Required:

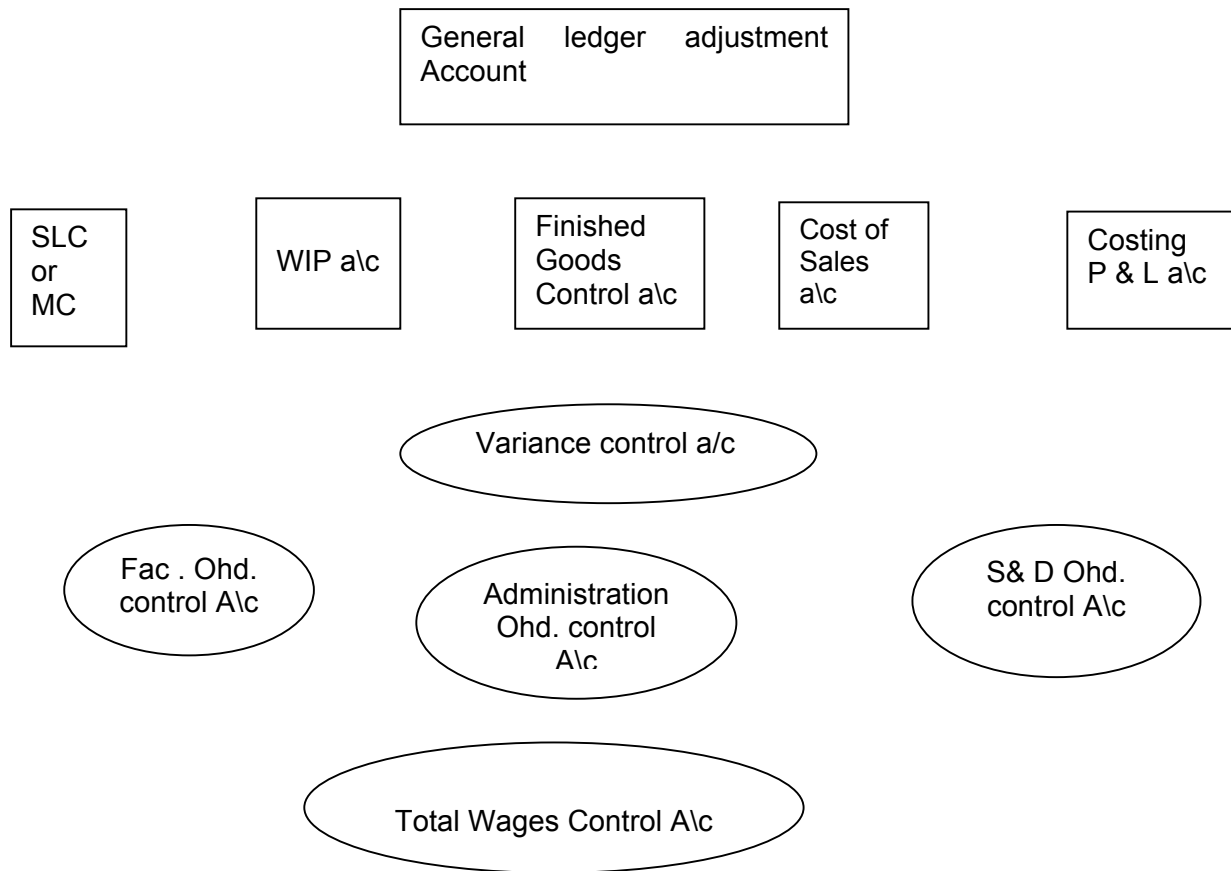
- Computation of standard cost of production of the shirts per dozen as well as in total for lot Nos. 45, 46 and 47.
- Find the variation in quantity of material used & labour hrs worked for each lot & in total.
- Calculate the material price variance; labour rate variance; variable overheads efficiency variance and fixed overheads volume variance.

Flow chart of Journals in Cost Accounting

Cost Control Accounts: following Absorption Costing:



Cost Control Accounts following Standard Costing: Partial Plan**Cost Control Accounts following Standard Costing: Single Plan**

Cost Control Accounts following Standard Costing: Partial Plan**Missing Figure :**

4. The standard cost card for a unit of product manufactured by a company is as under ;

Direct materials-	20 kg. @ Rs. 1.20	Rs. 24
Direct wages-	6 hrs. @ Rs. 6.00	Rs. 36
Overheads-	6 hrs. @ Rs. 2.00	Rs. 12

Profit margin is 20% of the selling price. Budgeted sales Rs. 54,000 per month. Actual data relating to April 2007 :

Sales	Rs. 46,750
Direct materials used	Rs. 15,000
Direct wages paid	Rs. 21,175

Analysis of variances : (in Rs.)		Favorable	Adverse	
Direct materials	Price	...	600	
	Usage	...	1,200	
Direct wages	Rate	...	3,025	
	Efficiency	1,650	...	
Overheads	Expenditure		200	...
	Volume	...	600	

You are required, from the data given to calculate the

- i) Actual output (ii) Actual profit (iii) Actual price per kg. of material (iv) Actual rate per direct labour hour v) Amount of overheads absorbed (vi) Budgeted output (vii) Overheads capacity variance (viii) Overheads efficiency variance (ix) Sales price variance (x) Sales volume profit variance

5. A company making a single standard product produces accounts for costing period as follows :

Direct Materials	3,960
Direct Wages	5,960
Variable Overheads	9,700
Fixed Overheads	5,200
Profit	4,880
Sales	29,700

The original budget was for 1,000 units per period, but during this period only 960 units were produced and sold. Standard direct wages rate is Rs.6 per unit and standard variable overhead rate is Rs.10 per unit. Cost variances during this period were :

	Gains Rs.	Losses Rs.
Material Price	--	40
Material Usage	--	80
Wage Rate	100	--
Labour Efficiency	--	300
Variable Overhead Price	400	--
Variable Overhead Efficiency	--	500
Fixed Overhead Cost	--	200
Selling Price	900	--

Prepare for the period the original budget and budgeted cost of actual sales.

6. ABC Ltd. adopts a standard costing system. The standard output for a period is 20,000 units and the standard cost and profit per unit is as under:—

Direct Material	3 units @ Rs. 1.500	4.50
Direct Labour	3 Hrs. @ Re. 1.00	3.00
Direct Expenses		0.50
Factory overheads: Variable		0.25
Fixed		0.30
Administration overheads		0.30
Total Cost		8.85
Profit		1.15
Selling price (Fixed by Govt.)		10.00

The actual production and sales for a period was 14,400 units. There has been no price revisions by the Govt. during the period. The following are variances worked out at the end of the period:—

	Favourable Rs	Adverse Rs
Direct Material : Price		4,250
Usage	1,500	
Direct labour : Rate		4,000
Efficiency	3,200	
Factory overheads		
Variable—Expenditure	400	
Fixed—Expenditure	400	
Fixed—Volume		1,680
Administrative overheads :		
Expenditure		400
Volume		1,680

You are required to :

- (a) ascertain the details of actual costs and prepare a Profit and Loss statement for the period showing the actual profit/loss. Show workings clearly.
 (b) Reconcile the actual profit with standard profit.

Novem --1981

7. On 1st April, 2007, ZED Company began the manufacture of a new electronic gadget. The company installed a standard costing system to account for manufacturing costs. The standard costs for a unit of the product are as under :

		Rs.
Direct Material	(3 kgs. At Rs. 5 per kg.)	15.00
Direct Labour	(0.5 hour at Rs. 20 per hour)	10.00
Manufacturing overhead	(75% of direct labour cost)	<u>7.50</u>
Total Cost		32.50

The following data was obtained from ZED Company's records for April, 2007 :

	Debit Rs.	Credit Rs.
Sales	--	1,25,000
Sundry Consumption (For purchase of direct materials in April 1998:68,250		--
Direct Material Price Variance	3,250	--
Direct Materials Usage Variance	2,500	--
Direct Labour Rate Variance	1,900	--
Direct Labour Efficiency Variance	--	2,000

The Actual Production in April 2007 was 4,000 units of the gadget, and the actual sales for the month was 2,500 units. The amount shown above for direct materials price variance applies to materials purchased during April, 2007.

Required :

- (i) Standard direct labour hours allowed for the actual output achieved.
 - (ii) Actual direct labour hours worked.
 - (iii) Actual direct labour rate.
 - (iv) Standard quantity of direct materials allowed (in kgs.)
 - (v) Actual quantity of direct materials used (in kgs.)
 - (vi) Actual quantity of direct materials purchased (in kgs.)
 - (vii) Actual direct materials price per kg.
8. Upasana Ltd. Manufactures paint. It uses a standard costing system { single plan) and the variances are reported to the management on fortnightly basis. A fire destroyed some important records of the company.
- You have been able to collect the following information from the spoilt papers/ records and as a result of consultation with accounting personnel in respect of a fortnight:
- (a) The paint requires two types of raw material RM1 and RM2 The standard quantity of RM2 in final product in 5 litres and standard cost thereof is Rs.36 per litre.
 - (b) The company purchased 200 kg. of RM1 and 550 litre of RM2 during that fortnight .
 - (c) The standard wage rate is Rs. 24 per labour hour. Actual labour hours were 460 during that fortnight.
 - (d) Variances as disclosed from some spoiled papers are:

(i) Price variance (RM2)	Rs. 1,320 (A)
(ii) Usage variance (RM1)	Rs. 240 (F)
(iii) Labour efficiency variance	Rs. 1,440 (A)
 - (e) Some incomplete ledger entries for that fortnight reveal

(1)	Sundry Creditors		
		Purchase of raw materials	Rs. 25,440
(2)	RM2		
	Opening balance	3,600	
		Closing balance	8,280
(3)	RM1		
	Opening balance	0	3,600
		Closing balance	1,200
(4)	Work-in-progress		
	Opening balance	0	
	RM2	14,400	Closing balance 0
(5)	Wages		
	Paid & outstanding	10,350	

You have been asked to compute the meaningful variances to be presented before the management.(Key computation should form part of the answer).

9. The following uncompleted accounts appear in the ledger of MDX plc for March 2005. The company operates a standard costing system, values stock at standard cost, and use a single plant- wide standard labour rate of Rs.6 per hour for all employees.

Raw materials

Balance b/f	Rs. 240	Price variance	Rs. 460
Creditors	?	Work in progress	6,000
		Balance c/f	180

Wages control

Gross wages	Rs. ?	Wage rate variance	Rs. 618
		Work- in- progress	?

Work- in- progress

Raw materials	Rs. 6,000	Labour efficiency variance	Rs. 900
Wages control	?	Finished goods	34,720
Material usage variance	1,440		
Production overhead control	?		

Production overhead control

Expenses- creditor	Rs. ?	Balance b/f	Rs. 345
Provision for depreciation	800	Work- in- progress	?
Volume variance	2,400	Expenditure variance	980
Balance c/f	260		

Data extracted from the standard cost card for MDX plc's only product is as follows:

		Rs./unit
Direct materials:	5 kg @ Rs.2.40/kg	12.00
Direct labour:	4 hours @ Rs.6/hour	24.00
Fixed overhead		20.00
Budget fixed overhead costs		Rs.10,000 per month.

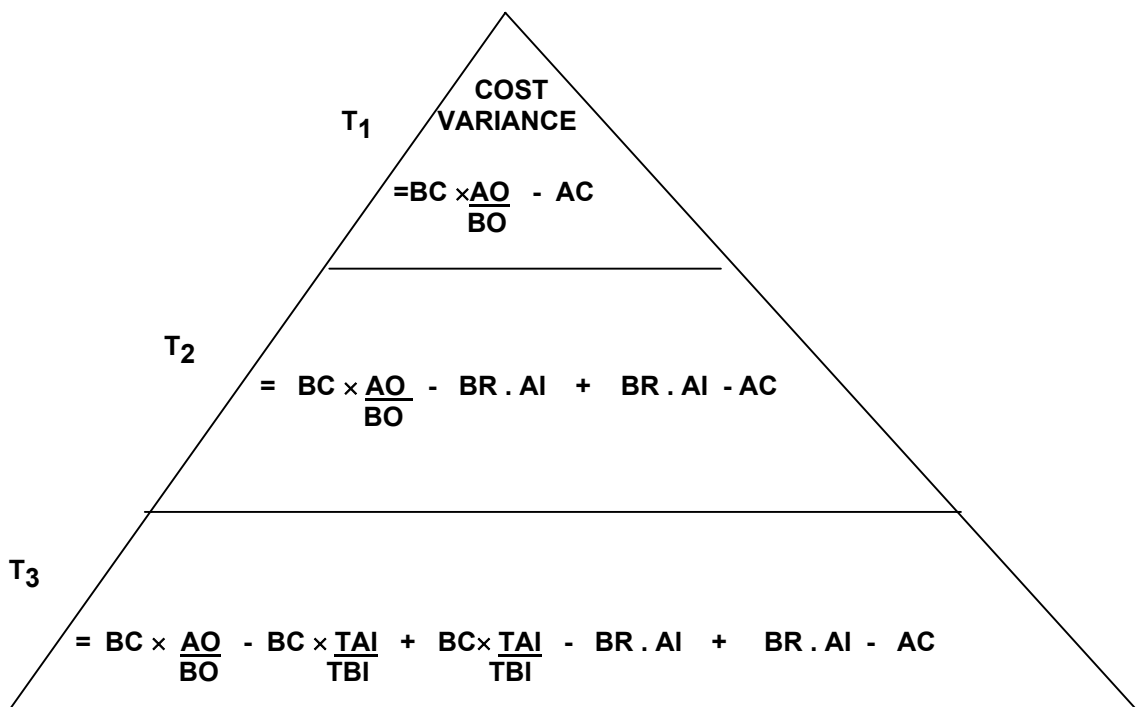
Calculate:

- The actual price paid per kilogram of materials;
- The actual output;
- The production overhead absorbed;
- The actual direct labour hours;
- The cost incurred in respect of expense creditors;
- The actual labour rate paid per hour.

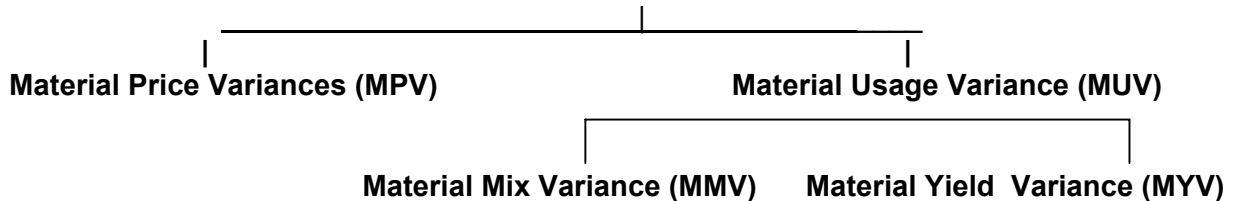
MATERIAL VARIANCE ANALYSIS:

Remember : (for cost variances)

Production Quantity = Output = Yield
= Input = Consumption



Material Cost Variances (MCV)



Important :

- Prepare Cost Card
- Calculate MPV , MUV , & MMV Separately for each Material if asked in the problem.
- If output is not given, consider it as one unit of output for material.

Material Variances:

10. A brass foundry making castings which are transferred to the machine shop of the company at standard price, uses a standard costing system. Basic standards in regard to materials, stocks which are kept at standard price are as follows

Standard mixture	70% Copper	30% Zinc
Standard price	Rs.2,400 per ton	Rs.650 per ton

Standard loss in melt 5% of input Figures in respect of a costing period are as follows :-

Commencing stock	Copper 100 tons	Zinc 60 tons
Finishing stock	Copper 110 tons	Zinc 50 tons
Purchases - Copper	300 tons cost Rs.7,32,500	Zinc 100 tons cost Rs.62,500
Material melted	400 tons.	
Casting produced	375 tons	

Calculate, using the weighted averaged valuation method, the individual ingredient price and mix variances and the total ingredient yield variance. Show WIP, SLC & Overhead control a/c under Single & Integral plan.

11. Compute the missing data indicated by the question marks from the following

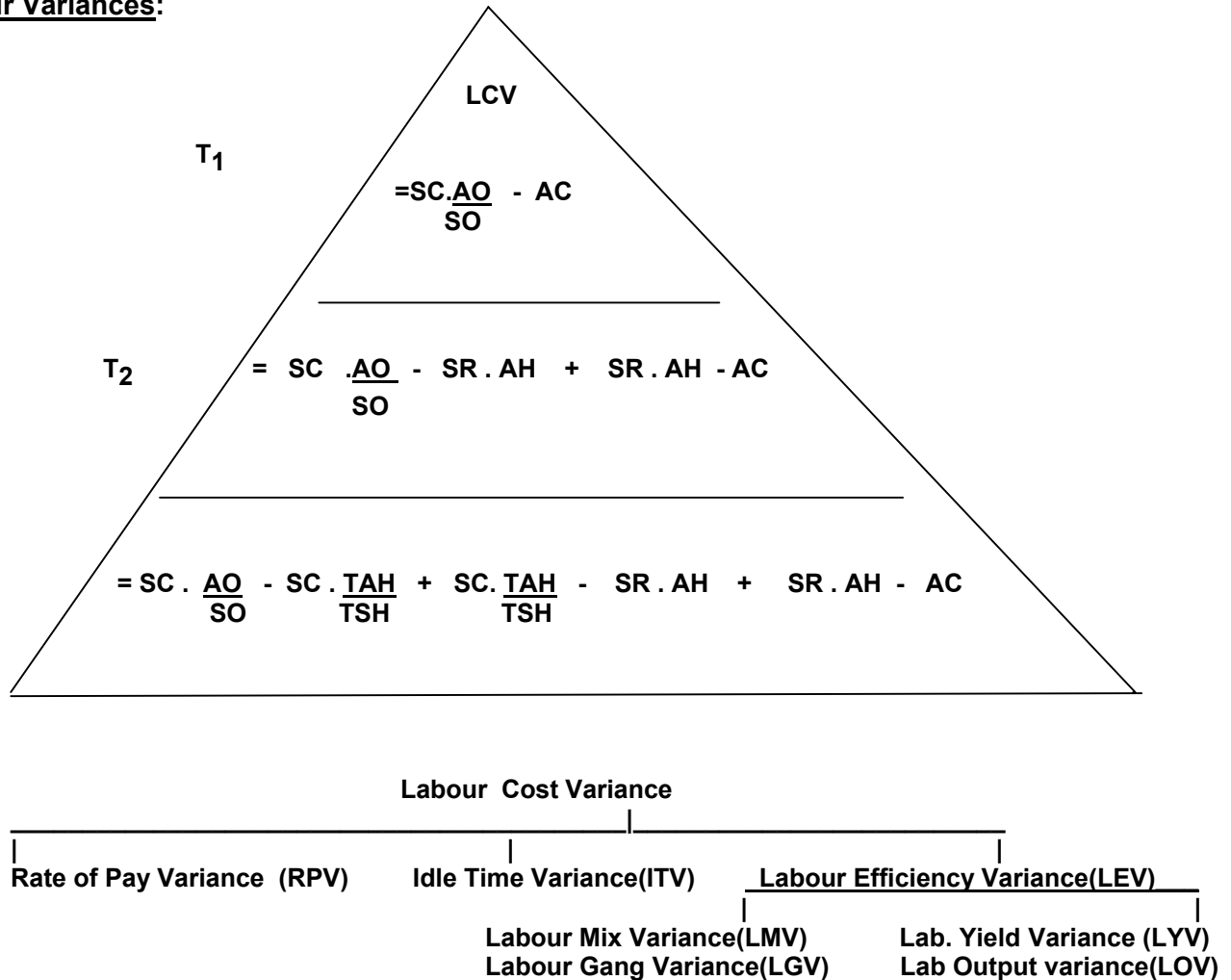
Particulars	A	B
Standard Price/kg	Rs. 12	Rs. 15
Actual Price/kg	Rs. 15	Rs. 20
Standard Input (kgs)	50	?
Actual Input (Kgs)	?	70
Material Price Variance	?	?
Material Uses Variance	?	Rs. 300 Adverse
Material Cost Variance	?	?

Material mix variance for both products together was Rs. 45 adverse.

Material Quality Cost Variance:

12. To produce 1,000 units of product X, the standard materials input is 1,200 units at a standard price of Rs. 6 per unit. The standard allows for rejects at the rate of 25% of input ; it is estimated that one-third of total rejects can be reworked at an additional standard cost of Rs. 2 per unit, Scrapped units can be sold for 50p each.

During the period just ended 19,500 units of X were produced. 24,000 units of materials were issued to production, actual rate was Rs. 8 per unit. 7,000 units were rejected on initial inspection and of these, 2,500 were reworked, at a cost of Rs. 5,100. The remainder were sold as scrap for 50p per unit. Calculate Quality cost variance, Mat Usage variance, Scrap realization variance, & Scrap rework variance.

Labour Variances:

In presence of idle time actual hour = Revised actual time + Idle Time. If output is not given, apply the definitions of Standard hours i.e. one labour hour = one unit

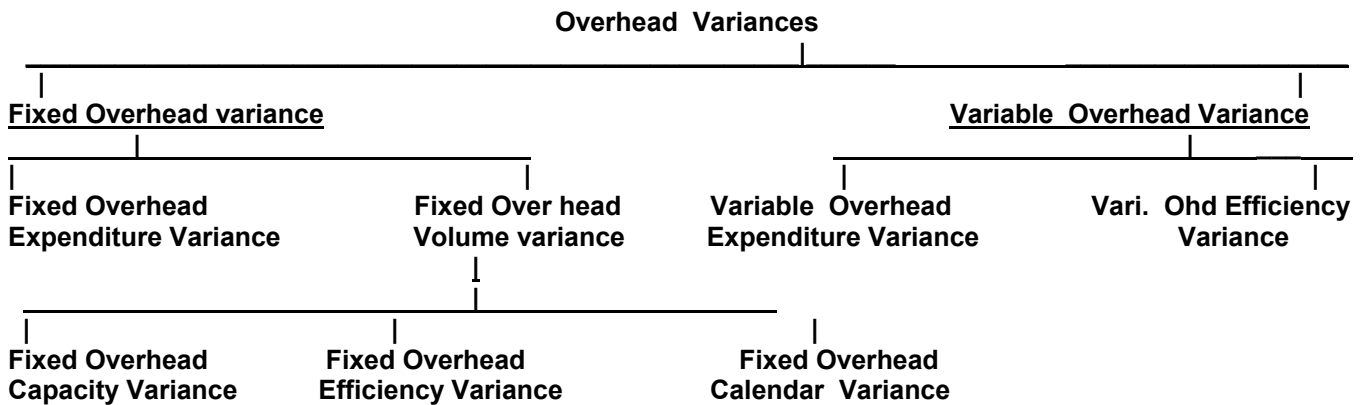
Problem

13. The standard & actual labour component engaged in a week for a job are under :

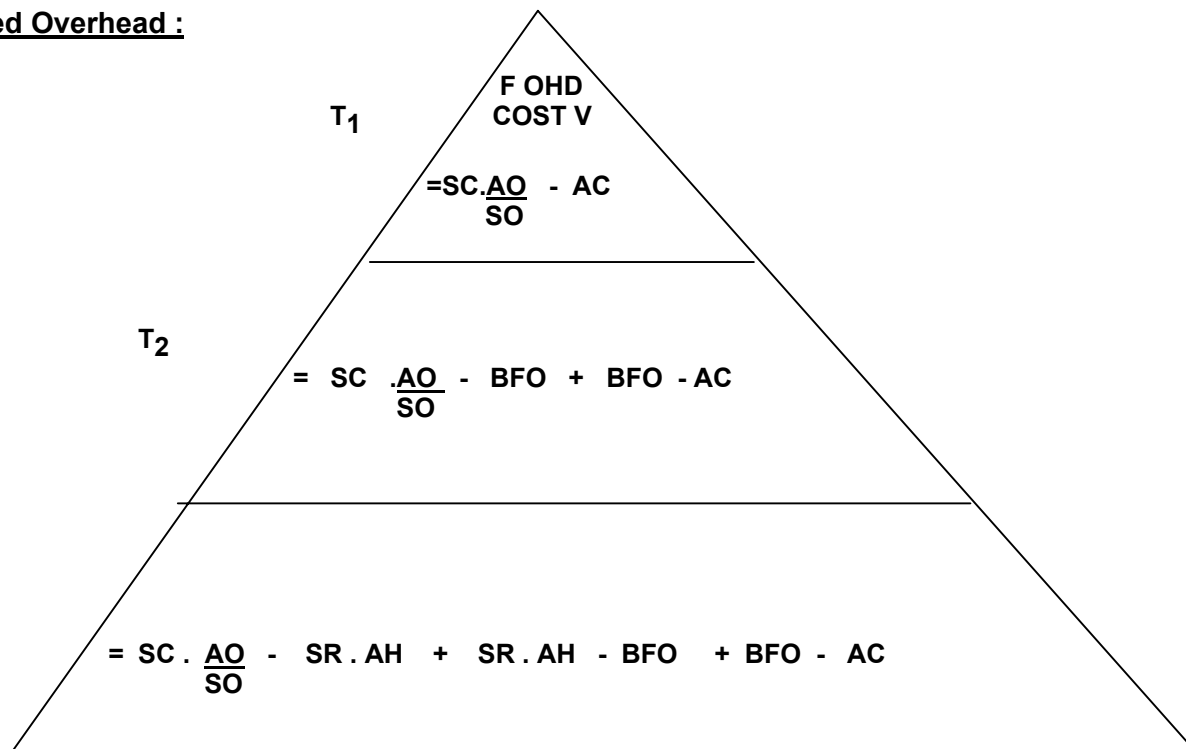
	Skilled workers	Semi-skilled workers	Unskilled workers
(a) Standard number of workers in the gang	32	12	6
(b) Standard wage rates per hour (Rs.)	3	2	1
(c) Actual number of workers employed in the gang during the week	28	18	4
(d) Actual wage rate per hour (Rs.)	4	3	2

During the 40-hour working week, the gang produced 1,800 standard labour hours of work. 200 hours of Skilled labour (included above) are getting a overtime @150%. 30 hours of unskilled labour were lost due machine breakdown & treated as abnormal idle time. Calculate the different labour variances.

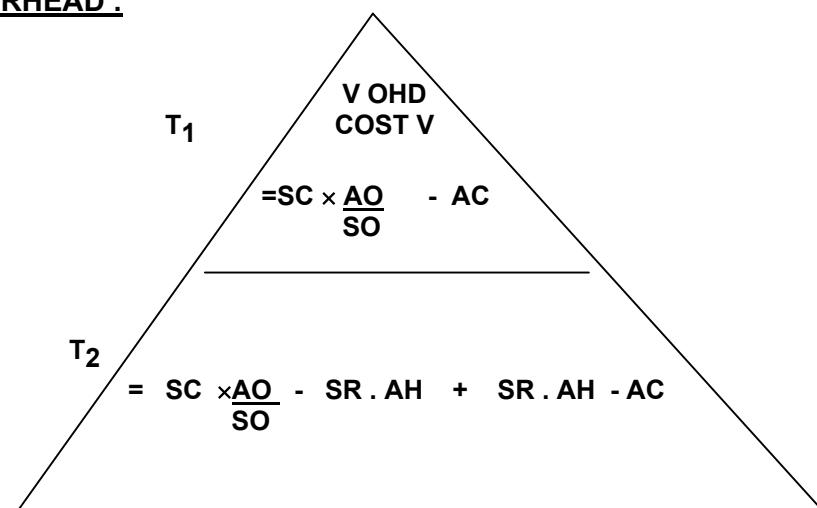
Overhead Variances: Always calculate overhead recovery or absorption rates on basis of budgeted activity level i.e. normal capacity. If nothing mentioned about the nature of overhead always consider it as fixed overhead.



Fixed Overhead :



VARIABLE OVERHEAD :



14. XYZ Ltd. has furnished you the following for the month of August :

		Budget	Actual
Output (units)		30,000	32,500
Hours		30,000	33,000
Fixed overhead	Rs.	45,000	--
Variable overhead	Rs.	60,000	--
Working days		25	26
Total factory Overhead			1,12,500

Calculate the variances Show the overhead control A/c.

15. F Manufacturing Ltd. uses the three variances method to analyse the manufacturing overhead variances. Manufacturing overhead variances for the fiscal year just were computed as follows :

Spending	Rs.86,000	Adverse
Efficiency	Rs.36,000	Favourable
Volume	Rs.80,000	Favourable

The manufacturing overhead application rate for the year was Rs.160 per machine hours of which Rs.60 per machine hour was the variable component. The year end balance in the Manufacturing Overhead Control Account was Rs.16,50,000 and the standard machine hours for the year were 11,300.

From the above data compute :

- Budgeted Machine Hours
- Actual Machine Hours
- Applied Manufacturing Overhead
- Total Amount of Fixed Overhead Cost.

(Nov 2000 Q 4b)

Equivalent Production : always apply FIFO for computation of variance

16. A processing company uses Standard Process Costing method. The Standard Process Cost Card is as follows :

		Rs. Per Kg. of Finished Product
Direct Material	-2 kgs. @ Rs.10 per kg	20
Direct Labour-	3 hrs. @ Rs.20 per hrs.	60
Fixed Overheads	(Recovered on labour hours)	<u>90</u>
Total		<u>170</u>

Budgeted output for the period is 1,000 kgs. Actual production and cost data for the period are; :

Actual production out of new input 950 kgs. Transferred to Finished stock – 1200 Kgs.

		Rs.
Direct material	2900 kgs.	32,000
Direct labour	3300 hrs.	68,000
Fixed overheads		88,000

Stocks :

Opening W.I.P. 250 Kgs. Degree of completion – Material – 100%, Labour & overheads – 60%.
Closing W.I.P. 450 Kgs., Degree of completion – Material – 100%, Labour & over heads – 20%.

The company uses FIFO Method for evaluation of stocks. Compute all Cost variances & show the Process Account.

17. A company manufactures a single product whose standard cost structure is as follows :-

Direct material 2.4 kgs, at Rs. 30 per kg ...	Rs.	72.00
Direct labour 6 Hours at Rs. 4 per hour ...	Rs.	24.00
Factory Overhead 6 Hours at Rs. 0.75 per hour ...	Rs.	<u>4.50</u>
TOTAL		<u>100.50</u>

The factory overhead is based on the following flexible budget :-

	<u>80%</u>	<u>90%</u>	<u>100%</u>	<u>110%</u>
Production (units)	<u>6,000</u>	<u>6,750</u>	<u>7,500</u>	<u>8,250</u>
Variable overheads (Rs.)	18,000	20,250	22,500	24,750
Fixed overheads (Rs.)	<u>10,250</u>	<u>10,750</u>	<u>11,250</u>	<u>11,750</u>
	<u>28,250</u>	<u>31,000</u>	<u>33,750</u>	<u>36,500</u>

Budgeted Production 7,300 units
Actual data for the month of January 2006

Materials used	19,240 kgs. at Rs. 31 per kg.
Direct labour	46,830 Hours at Rs. 4.20 per hour
Actual factory overhead	Rs. 36,340
Actual Production	7620 units

Details of Work-in-progress Opening ... 120 units, materials fully supplied, 50% converted.
Closing ... 100 units, materials fully supplied, 50% converted.
Determine and analyse all the variances

18. File and Smile Associates undertake to prepare income tax returns for individuals for a fee. Their advice to their clients is to pay the proper tax and relax. In order to arrive at the proper scale of fees and assess their own performance, they have a good system. They use the weighted average method and actual costs for financial reporting purposes. However, for internal reporting, they use a standard cost system. The standards, based on equivalent performance, have been established as follows :

Labour per return: 5 hrs. @ Rs. 40 per hr. Overhead per return: 5 hrs @ Rs. 20 per hr.

For March 2006 performance, budgeted overhead is Rs. 98,000 for the standard labour hours allowed. The following additional information pertains to the month of March 2006 :

March 1	Returns in Process (25% Complete)	200 Nos.
	Returns started in March	825 Nos.
March 31	Returns in Process (80% Complete)	125 Nos.

Cost data

March 1	Returns in Process :Elements of Cost	
	Labour	Rs. 12,000
	Overheads	Rs. 5,000
March 1 to 31	Labour 4,000 hrs.	Rs. 1,78,000
	Overheads	Rs. 90,000

You are required to compute

- for each cost element, equivalent units of performance and the actual cost per equivalent unit
- actual cost of returns in process on March 31
- the standard cost per return
- The total labour, labour rate and labour efficiency variances as well as total overhead volume and overhead budget variance.

19. A company manufacturing two products uses standard costing system. The following data relating to October, 2006 have been furnished to you :

Products	A (Rs.)	B (Rs.)
Standard Cost per Unit :		
Direct Materials	2	4
Direct Wages	8	6
Fixed Overheads	16	12
Unit processed In process :		
Beginning of the month : All materials applied and 50% complete in respect of labour and overheads	4,000	12,000
End of the month : All materials applied and 80% complete in respect of labour and overheads	8,000	12,000
Units completed & transferred during the month	16,000	20,000

During the month , direct materials purchased at standard price amount to Rs.2,00,000 and the actual cost of which is Rs.2,20,000. Direct materials used for consumption at standard price amount to Rs.1,75,000.

Direct wages for actual hours worked at standard wage rates were Rs.4,20,000 and at actual wage rates were Rs.4,12,000. Fixed overheads budgeted were Rs.8,25,000 and the actual fixed overheads incurred were Rs.8,50,000. Calculate all the variances & standard cost of work-in-process at the end of the month.

Multi-product with common input problems

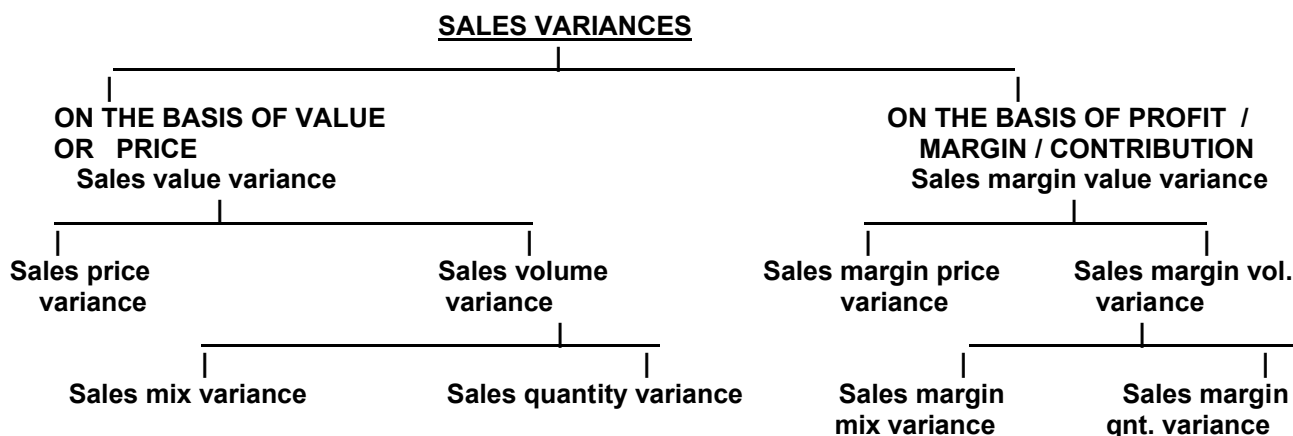
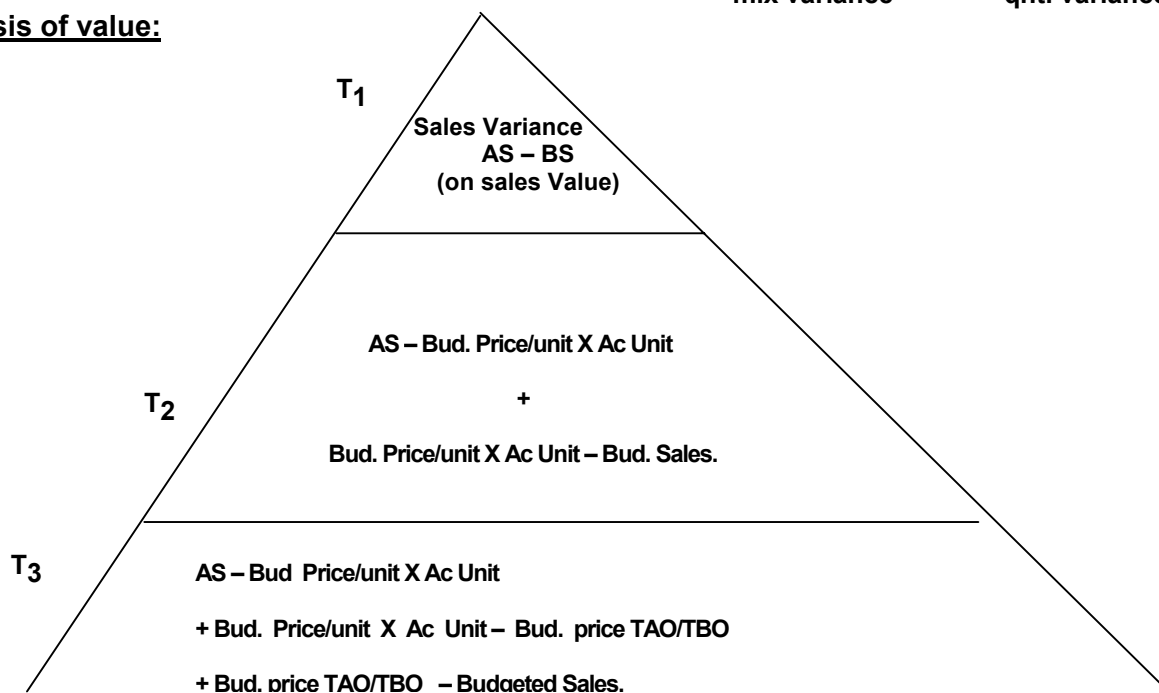
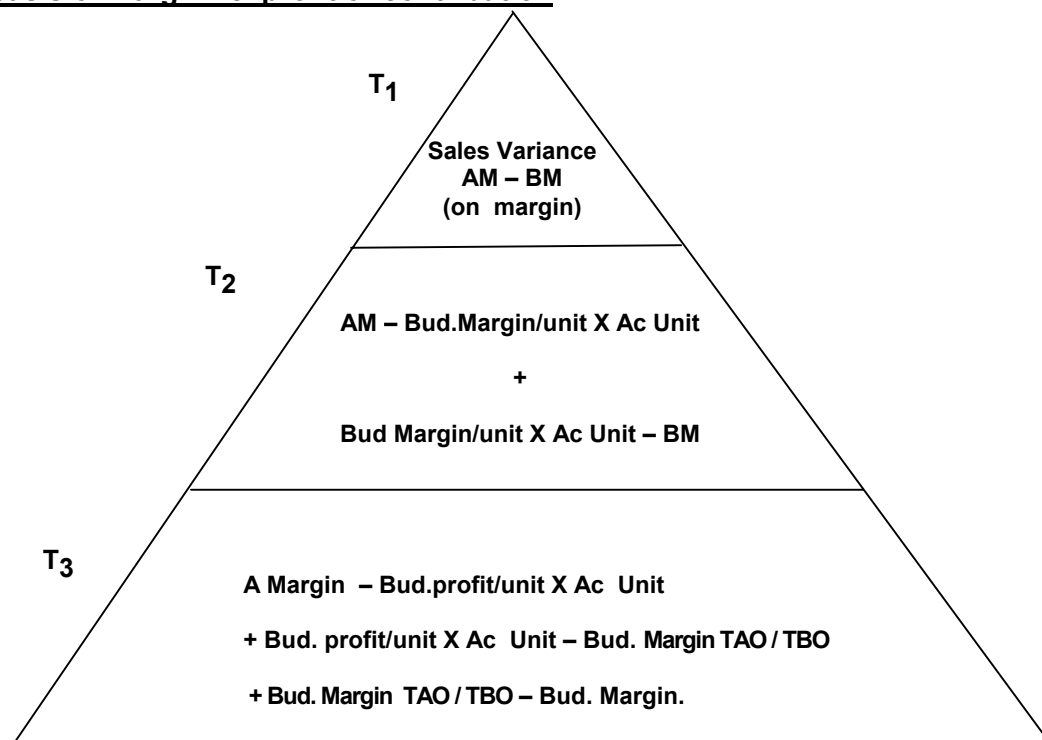
20. From the data given below, calculate the MUV & MPV on purchase :

	X		Y	
	Qty. kg	Value Rs.	Qty. kg	Value Rs.
Raw Material Purchased	2,000	4,000	5,000	6,250
Issues to works stock	2,150	-	3,950	-
Works stocks of material :				
Opening	300	-	1,000	-
Closing	200	-	1,250	-
Standard price :	Rs. 1.90 per kg.		Rs. 1.30 per kg.	
Standard usage :Product A	1 kg.		1 kg	1,130 units
Product B	0.5 kg		1.kg.	2,550 units

21. A factory manufactures two products A & B in 2 production departments X and Y, The standard costs are

	Production Department	
	X	Y
Standard wage rate per hour	Rs.3	Rs.4
Labour cost per unit Product A	3	5
Product B	4	4
During a month of 200 hours,		
Actual wages paid (Rs.)	92,000	1,30,000
Production in units product A	8,000	11,000
Product B	15,000	16,000

Throughout the period, the departments X and Y employed 150 and 160 direct workers respectively. In the department Y all workers are idle for 5 hrs due to accident during this period. Show LEV & LRV .

**On the basis of value:****On the basis of Margin i.e. profit or contribution**

Important :

1. **Standard Margin** = Std. sales price - Standard cost
Actual Margin = Actual sales price - Standard cost
2. When both sale price & costs are given always calculate the Margin Variances.
3. Market Share & Size variance are the subset of the volume variance

Market Share variance =

(actual sales units – budgeted share of actual market) std margin p.u.

Market Size variance =

(budgeted share of actual market – budgeted sales units) std margin p.u.

In case of more than one product std. Margin represents the weighted average.

Sales:

22. Compute the sales variances from the data given below ;

Produce	Budgeted quantity units	Actual quantity units	Budgeted sale price per unit Rs.	Actual sale price per unit Rs.	Standard cost per unit Rs.
X	240	400	50	45	30
Y	160	200	25	20	15
Market potential	4,000	7,000			

23. Super Computers manufactures and sells three related PC Models:

- (1) PC – Sold mostly to college students
- (2) Portable PC – Smaller version of PC positioned as home computer
- (3) Super PC – Sold mostly to business executives.

Budget for 2007				
Selling price p.u..(Rs)	Variable Cost p.u.(Rs)	Contribution p.u.(Rs)	Sales units	
PC	24,000	14,000	10,000	7,000
Portable PC	16,000	10,000	6,000	1,000
Super PC	1,00,000	60,000	40,000	2,000

Actual for 2006				
	Selling price Rs./unit	Variable Cost Rs. /unit	Contribution Margin Rs./unit	Sales Units.
PC	22,000	10,000	12,000	8,250
Portable PC	13,000	8,000	5,000	1,650
Super PC	70,000	50,000	20,000	1,100

Super computer derived its total unit sales budget for 2007 from the internal management estimate of a 20% market share and an industry sales forecast by computer manufacturers association of 50,000 units. At the end of the year the association reported actual industry sales of 68,750 units. Compute all the variances in individual product and total sales .

24. Saleswell Ltd. sells a range of products. For each quarter, sales quotas are fixed for each salesman and a 5% commission is given on actual orders booked in addition to a fixed monthly salary.

FOR THE QUARTER JANUARY-MARCH 2006

Salesmen	A (Rs.)	B(Rs.)	C(Rs.)	D(Rs.)
Commission earned	2,300	1,650	2,985	2,110
Standard Cost of Quota Sales	29,400	26,000	28,400	24,000
Sales Price Variance	600 (U)	6,000 (U)	2,300 (U)	2,700 (F)
Sales Volume Variance	800 (U)	1,000 (U)	14,000 (F)	500 (U)
Margin Volume Variance	900 (U)	1,400 (U)	4,270 (U)	1,800 (F)

You are required to :

- Compute the Sales Quota given to each salesman and their actual contribution made.
 - Rank the Salesmen according to performance, explaining the basis.
 - Comment on the use of commission as an incentive.
25. The sales performance of SATYA Ltd. a dealer in toy-products for 2005-06 was as follows :

Product Units	TV sets 40,000 Rs.	Washing m/cs 1,00,000 Rs.	Computers 1,80,000 Rs.	Total 3,20,000 Rs.
Revenue	3,20,000	4,80,000	5,00,000	13,00,000
Standard cost	2,00,000	3,00,000	3,60,000	8,60,000
Profit	1,20,000	1,80,000	1,40,000	4,40,000

The company is in the process of producing the budget for 2005-06 and, whilst the above actual figures are useful, it would like to know what was in the 2005-06 budget. Unfortunately this information seems to be lost and only one or two crumb of information have come to light, i.e. :

- sales margin quantity variance is Rs.33,333.33 (F);
- Average standard margin per unit Rs.1.6667;
- Budgeted sales (in unit) of washing machines were achieved;
- TV sets were sold at the standard selling price;
- The standard selling price of TV sets per-unit is as much as a unit of each of the other two product lines put together;
- Sales price variance is Rs.60,000 (A).

Produce the sales budget for 2005-06 showing (a) number of units, (b) unit price, (c) total cost, and (d) total profit for each item and in total. Show supporting calculations.

Reconciliation:

26. The standard cost sheet of a company based on the normal output of 30,000 units for a quarter is as under :

		Rs.
Direct Materials	4 kg. @ Rs. 2 per kg.	8.00
Direct Wages	6 Hours @ Rs. 4 per hour	24.00
Overheads	50% of Direct Wages	<u>12.00</u>
Total Costs		44.00
Profit		<u>6.00</u>
Selling Price		<u>50.00</u>

The budgeted fixed overheads amount to Rs. 1,44,000 per quarter and it is included in the overhead cost given above. On the basis of the budgeted activity of 36,000 units, the company estimated the profit for the second quarter of the year as under :

Management Accountancy**Cost Management-53**

Direct Materials	Rs. 2,88,000
Direct Wages	8,64,000
Overheads	<u>4,32,000</u>
Total Costs	15,84,000
Sales	<u>18,00,000</u>
Profit	2,16,000

Actual data for the second quarter :

Production 25,000 units

Direct materials purchased 1,06,000 kg. at Rs. 2.25 per kg.

Direct material consumed 96,000 kg

Direct wages paid 1,60,000 hrs @Rs. 4.10 per hu. including abnormal idle time 6,000 hrs

Overheads Rs. 3,32,000 out of which Rs. 1,50,000 were fixed.

Sales 25,000 units at an average price of Rs. 51.50 per unit.

You are required to prepare an operating statement reconciling from budgeted profit

27. The following information is available from the record of Sunrise Ltd. Producing only one product:

<u>Budgeted Income Statement : January 2007</u>		Rs.	Rs.	Rs.
Sales Revenue:20,000 units	@ Rs. 5			1,00,000
Budgeted Production costs of 20,000 units				
Direct Materials :				
A	(10,000 kg. @ Rs. 0.30)	3,000		
B	(10,000 kg. @ Rs. 0.70)	<u>7,000</u>	10,000	
Direct Labour :				
Skilled	(9,000 Hrs. @ Rs. 3.00)	27,000		
Un – skilled	(5,200 Hrs. @ Rs. 2.50)	<u>13,000</u>	40,000	
Production Overhead : Fixed			20,000	
Variable (20,000 units @ Rs. 0.50)			<u>10,000</u>	
			80,000	
Add: Opening Stock	(1,000 units @ Rs. 4.00)		<u>4,000</u>	
			84,000	
Deduct : Closing Stock	(1,000 units @ Rs. 4.00)		<u>4,000</u>	<u>80,000</u>
Budgeted Profit				<u>20,000</u>

During January 2007 production and sales were both above budget and the following income statement was prepared :

Income Statement January 2007	Rs.	Rs.	Rs.
Sales Revenue :			
14,000 units at Rs. 5		70,000	
8,000 units at Rs. 4.75		<u>38,000</u>	1,08,000
Production Costs :Actual production 24,000 units			
Direct Materials :			
A (16,000 kg. @ Rs. 0.20)	3,200		
B (10,000 kg. @ Rs. 0.80)	<u>8,000</u>	11,200	
Direct Labour :			
Skilled (13,000 hrs. @ Rs. 2.95)	38,350		
Un-skilled (6,300 hrs. Rs. 2.60)	<u>16,380</u>	54,730	
Overhead Costs : Fixed	18,020		
Variable (24,000 units @ Rs. 0.625)	<u>15,000</u>	98,950	
Add: Opening Stock (1,000 units)		<u>4,000</u>	
		1,02,950	
Deduct Closing stock (3,000 units)		<u>12,000</u>	
Cost of Goods Sold			<u>90,950</u>
Actual Profit			<u>17,050</u>

In the period 1,000 abnormal idle hours for skilled labour was reported. Prepare a standard costing statement analysing the differences between the budget and the actual performance.

28. The trading results of ZED Ltd. for 2004-05 and 2005-06 are as follows :

	2004-05	2005-06
	Rs.	Rs.
Material	1,60,000	2,05,200
Wages	96,000	1,32,000
Variable Overheads	40,000	46,000
Fixed Overheads	<u>50,000</u>	<u>54,800</u>
Total costs	3,46,000	4,38,000
Profit	54,000	90,000
Sales	<u>4,00,000</u>	<u>5,28,000</u>

Selling price was enhanced by 10 % in 2005-06 . Material prices and wages rates too have increased by 8 % and 12 % respectively. Prepare profit reconciliation statement.

29. Prepare a statement showing how much factor has contribution to the variation in profit.

Items	2005	2006
	Rs. in lakhs	Rs. in lakhs
Sales	600	770
Direct Materials	300	324
Direct Wages	120	137
Variable Overhead	60	69
Fixed Overhead	80	150
Profit	<u>40</u>	<u>90</u>
Raw Mat. Consumed (in kg)	1,20,000	1,35,000
Direct Labour Hours	24,00,000	26,00,000

Sales price increase by 10%. Reconcile Profit for two years.

30. An Airline Company's budget and actual for the Quarter January to March, 2005 are as under :
Rs. in Million

	Budget	Actual
Income	200	209.0
Variable Costs	<u>120</u>	<u>145.2</u>
Contribution	80	63.8
Fixed Costs	<u>70</u>	<u>68.0</u>
Operating Profit (Loss)	10	(4.2)

The following further details are available :-

- (a) There was a 9% decrease in air-fare resulting in a 5% decrease in the income for the quarter.
- (b) Variable Costs like fuel, wages, catering etc. are increased by 10% over the budget. Prepare and analysis reconciling the budgeted and actual profits for the quarter.
31. You are appointed Cost Accountant of Zed Ltd. Given below is the company's operating report for March 2006:-

	Standard and Variances Rs.	Actual Rs.
Sales—Budgeted	18,000	
Variances due to :		
Volume of orders	1,000	
Selling prices	<u>400</u>	<u>19,400</u>
Profit—Budgeted	3,800	
Variances due to:		
Sales volume	240	
Sales Price	<u>400</u>	<u>4,440</u>
Production cost variances:		
Labour—Rate	(250)	
—Efficiency	<u>(100)</u>	<u>(350)</u>
Material—Price	150	
—Usage	<u>(60)</u>	<u>90</u>
Overhead—Expenditure—Fixed	100	
—Variable	(250)	
—Efficiency	200	
—Capacity	<u>100</u>	<u>150</u>
Operating Profit		<u>4,330</u>

Your assistant provides the following information about sales and costs for April 2006 :-

Sales	Budgeted Units	Sales value Rs.	Actual units	Sales value Rs.
Product A	250	10,000	280	10,800
Product B	200	6,000	190	5,500
Product C	150	<u>3,000</u>	180	<u>3,500</u>
		<u>19,000</u>		<u>19,800</u>

Product	Standard selling price p.u. Rs.t	Standard product costs p.u. Rs
A	40	31
B	30	25
C	20	15

Labour	Rs.
Standard labour cost per hour	0,90
Budgeted hours	4,000
Actual clocked hours	4,400
Standard hours produced	4,500
Actual labour cost	4,260
Materials	
Standard cost of material actually used	5,230
Standard cost of material allowed	5,330
Actual cost of material used	5,430
Overheads	
Budgeted rates of overhead recovery per labour hour:	
Fixed	0.50
Variable	1.00
Actual overhead costs :	
Fixed	2,000
Variable	<u>4,300</u>
Total	<u>6,300</u>

Prepare the operating statement for April 2006 in the same form as for March 2006.
May 1986

Standard on Marginal & Absorption Costing

32. You have been provided with the following data for S plc. For September 2006.:

Accounting method :	Absorption	Marginal
<u>VARIANCES</u>	<u>Rs.</u>	<u>Rs.</u>
Selling price	1,900 (A)	1,900 (A)
Sales volume	4,500 (A)	7,500 (A)
Fixed overhead expenditure	2,500 (F)	2,500 (F)
Fixed overhead volume	1,800 (A)	n/a

During September 2006 production and sales volumes were as follows :

	Sales	Production
Budget	10,000	10,000
Actual	9,500	9,700

Find (i) the standard contribution per unit ;
(ii) the standard profit per unit &
(iii) the actual overhead cost total.

33. ZED plc sells two products, the Alpha and the Beta. These are made from there different raw materials that are bought from local suppliers using a JUST-in-Time (JIT) purchasing policy. Products Alpha and Beta are made to customer order using a JIT manufacturing policy. Overhead cost are absorbed using direct labour hours as appropriate.

The following information relates to October 2006 :

	Alpha	Beta
Budgeted production (units)	2,400	1,800

The standard selling price is determined by adding a 100% mark-up to the standard variable costs of each product.

Standard variable costs per unit	Alpha Rs.	Beta Rs.
Direct materials X (Rs.5 per metre)	10.00	12.50
Direct materials Y (Rs.8 per litre)	8.00	12.00
Direct materials Z (Rs.10 per kg)	5.00	10.00
Direct labour (Rs.7 per hour)	14.00	10.50
Variable overhead costs	3.00	2.25

Actual data for October 2006

Direct materials X	10,150 metres	costing	Rs.48,890
Direct materials Y	5,290 litres	costing	Rs.44,760
Direct materials Z	2,790 kgs.	costing	Rs.29,850

Direct labour	9,140 hours paid	costing	Rs.67,980
Direct labour paid for	8,350 hours worked		

Fixed overhead Rs.72,000.

Variable overhead Rs.14,300.

Actual production	Alpha	3,000 units
	Beta	1,500 units

Sales variances

The following sales variances have been calculated :

	Absorption costing		Marginal costing	
	Alpha Rs.	Beta Rs.	Alpha Rs.	Beta Rs.
Selling price	6,000 (A)	4,500 (F)	6,000 (A)	4,500 (F)
Sales volume	18,000 (F)	11,925 (A)	24,000 (F)	14,175 (A)

Required :

- Calculate the budgeted fixed overhead cost for October 2005.
- Calculate the budgeted profit for October 2005
- Calculate the actual profit for October 2005.
- Prepare a statement, using absorption costing principles, that reconciles the budgeted and actual profits for October 2005. showing the variances in as much details as possible. Do not calculate materials mix and yield variances.

- 34.** The executives of Something More Ltd. had several meetings among themselves and finalized the Budget for 2007 for submission to the Board of Directors. The budget envisaged an estimated revenue of Rs.33 lakhs for the year. On a scrutiny of the budget the Board felt that there was scope for profit improvement at least to the extent of 10% on the budgeted revenue.

In 2006 the total sales of all companies in the industry were 10 lakhs units' out of which the Co.'s sales were 1 lakh units. For 2007, the Sales Manager had assumed the same total industry market volume and company's sales share. The board directed that this area of volume & penetration be re-examined and a profit improvement plan submitted in consultation with other executives.

The plan submitted after due consideration embodied the following :

- (i) The total industry volume would grow in 2006 to 12 lakh units and the Co's penetration would be stepped up from the present 10% to 11%;
- (ii) The sales mix will be changed from 50% of each size unit to 60% of the larger and 40% of the smaller with a contribution of Rs.11 and Rs.9 per unit respectively. The selling price would be so raised that an additional contribution of Rs.0.50 per unit is available uniformly on all units;
- (iii) Additional expenses of Rs.50,000 on advertisement. & sales promotion and Rs.25,000 on sales force would be incurred during the year while a saving of Rs.30,000 would be made in sales office administration. Improvements in the design of packaging are expected to cost Rs.35,000;
- (iv) Curtailing credit terms would result in saving Rs.1 lakh, while larger finished goods inventories would cost Rs.70,000 more. (The Co. borrows money at 18% per annum).

You are required to draw the Profit improvement plan in financial terms, spelling out separately the increase or decrease in profit due to volume, price, expenses and financing charges.

Standard in Service Sector

35. A practicing doctor who had some vacant space in his chamber established a new specialist unit providing two types of health check-Primary and Advanced.

For primary check-up the service of only a trained nurse is required and it takes 30 minutes. In case a person wants an Advanced health check-up to be done after the Primary check up, he is referred to the Doctor and an additional 60 minutes are required for medical assessment by the Doctor. The Nurse and the Doctor work independently of each other. The standard labour rates are as under:

Trained Nurse	Rs. 200 per hour
Doctor	Rs. 500 per hour

In the first month, it was estimated that there would be 200 nos. of Primary Health check-up cases and 50 cases of Advanced Health check-up. The fixed overhead for the specialist unit for the month was budgeted at Rs. 30,000. These overheads were to be absorbed on the basis of per hour spent on check-up.

The actual results for the particular month were:

- (a) Check-ups carried out:

Primary health check-up	220 nos.
Advanced health check-up	60 nos.
- (b) Time spent on check-up:

Trained Nurse	125 hours
Doctor	70 hours
- (c) Amount spent on

Trained Nurse	Rs. 30,000
Doctor	Rs. 42,000

You are required to

- (i) Calculate standard cost of Primary Health Check-up and Advanced Health Check-up.
- (ii) Prepare an operating cost statement for the month for the specialist unit showing standard cost and actual cost with variances.

06/2005/02

36. Budgetary control and standard costing are used within an insurance company and a standard cost of Rs. 20 has been set for obtaining and issuing each new life policy.

Prior to the commencement of the annual financial period, the life business manager had forecast that 7,500 policies would be sold during the year and the Rs. 20 standard cost was based on the following budgeted costs for the department. Actual costs are also shown.

Code	Budget	Actual
301	Rs. 30,000	Rs. 33,750
302	30,000	28,500
303	15,000	13,000
431	45,000	50,000
599	30,000	33,000
	1,50,000	1,58,250

At the end of the year, it was ascertained that

- 6,750 new life policies had been issued.
- The sales staff and underwriting staff received as salaries pay award of 12 ½% which had been back – dated to the beginning of the year and this had not been included in the budget.
- Expenses on codes 302, 303 and 431 are regarded as direct costs which vary with activity, and those on code 301 are treated as a direct fixed cost whilst those on code 599 are an indirect fixed cost.

You are required to

- Present a statement (or control report) for the life business manager showing the variances which have arisen.
- Comment on the likely cause or causes for each variances identifying, so far as you can from the information given, how much of each variance arises from price differences and how much can be related to efficiency or inefficiency.

Answer

Control Report				
Code	Fixed budget 7,500 units Rs.	Flexed Budget 6,750 units Rs.	Actual 6,750 Rs.	Variances Rs.
301 Sales Salaries	30,000	30,000	33,750	3,750 (A)
302 Staff commission	30,000	27,000	28,500	1,500 (A)
303 staff expenses	15,000	13,500	13,000	500 (F)
431 Underwriting staff	45,000	40,500	50,000	9,500 (A)
599 Other Admin. Costs	30,000	30,000	33,000	3,000 (A)
	<u>1,50,000</u>	<u>1,41,000</u>	<u>1,58,250</u>	<u>17,250 (A)</u>

- Sales salaries Rs. 3,750 (A) Rate Variance is due to unanticipated pay award.
Sales Commission – Rs. 3,000 (F) is due to drop in activity and Rs. 1,500 (A) may be due to increasing sales commission selected policies or due to inefficiency.

Sales expenses – Rs. 1,500 reduction due to drop in activity and Rs. 500 (F) for improved control.

Underwriting salaries – Rs. 4,500 (F) due to drop in activity, Rs. 5062 (A) due to unbudgeted salaries increases and Rs. 4,438 (A) due to inefficiency.

Other Administration – Rs. 3,000 (A) seem to have been caused by changes due to high cost suppliers or hiring temporary office staff.

Planning & Operating Variances

Some variances will arise through factors that are entirely, or almost entirely, within the control of management. These may be referred to as operational variances. Other variances can arise from changes in factors external to the business, and may be referred to as planning variances. The official Terminology defines operational and planning variances as follows:

Operational variance: A classification of variances in which non-standard performance is defined as being that which differs from an ex post standard. Operational variances can relate to any element of the standard product specification.

Planning variance: A classification of variances caused by ex ante budgeted allowances being changed to an ex post basis. Also known as a revision variance.

Management will wish to draw a distinction between these two variances in order to gain a realistic measure of operational efficiency. As planning variances are self-evidently not under the control of operational management, it cannot be held responsible for them, and there is thus no benefit to be gained in spending time investigating such variances at an operational level. Planning variances may arise from faulty standard-setting, but responsibility for this lies with senior, rather than operational, management.

It should be noted that all deviations of cost between actual and budgeted can be subdivided and attributed to either planning or operational causes

37. Big plc set up a factory to manufacture and sell 'Advance', a new consumer product. The first year's budgeted production and sales were 1,000 units. The budgeted sales price and standard costs for 'Advance' were:

	Rs.	Rs.	
Standard rate price (per unit)		200	
Standard costs (per unit):			
Raw materials (10 kg at Rs. 10)		100	
Labour (6 hours at Rs. 8)		<u>48</u>	
			<u>(148)</u>
Standard contribution (per unit)		<u>52</u>	
Actual results for the first year were:	Rs.'000	Rs. '000	
Sales (1,000 units)		316	
Production costs (1,000 units):			
Raw materials (10,800 kg)		194.4	
Labour (5,800 hours)		<u>69.6</u>	
			<u>(264)</u>
Actual contribution (1,000 units)		<u>52</u>	

The managing director made the following observations on the actual results:

In total, the performance agreed with budget; nevertheless, in every aspect other than volume, there were large differences.

Sales were made at what was felt to be the highest feasible price, but we now feel that we could have sold for Rs. 330 with no adverse effect on volume. Labour costs rose dramatically with increased demand for the specialist skills required to produce the product, and the general market rate was Rs. 12.50 per hour-although we always paid below the general market rate whenever possible.

The raw material cost that was expected at the time the budget was prepared was Rs. 10 per kilogram. However, the market price relating to efficient purchases of the material during the year was Rs. 17.00 per kilogram.

It is not proposed to request a variance analysis for the first year's results. In any event, the final contribution was equal to that originally budgeted, so operations must have been fully efficient. Despite the managing director's reluctance to calculate it, you are requested to calculate the traditional variance analysis and Planning & Operational Variance. St mat CIMA -114

38. HT plc, a food manufacturer, produces a range of processed foods including a range of high-quantity soups which it sells to hotels and caterers. One of these, CC soup, has the following standard ingredient list for 1,000 litres of soup :

Ingredient	Volume (litres)	Standard Cost / litre Rs.	Standard cost Rs.
A	30	1.42	42.60
B	25	1.25	31.25
C	5	3.50	17.50
D	<u>45</u>	2.45	<u>110.25</u>
	<u>105</u>		<u>201.60</u>

During October 2006, HT plc produced 5,400 litres of its CC soups using the following:

Ingredient	Volume(lt)	Actual cost / litre (Rs.)
A	1,740	1.50
B	1,800	1.20
C	540	4.00
D	1,200	2.30

Required :

- Calculate, using the weighted averaged valuation method, the individual ingredient price and mix variances and the total ingredient yield variance for October 2005.
- HT plc uses a semi-automated processing unit to convert the ingredients of CC soup into the finished product. The standard variable processing costs for each 100 litres of CC soup are 0.8 processing hours at Rs.240 each processing hour

During October 2005, the actual processing time was 37 hours at a total cost of Rs.9.250.

It has now been realised that a new, faster machine was operated in October 2001, which should have reduced the processing time required by 20%.

The fixed costs of the semi-automated processing unit are not considered to be a product related cost.

Required :

- Calculate the planning variable processing cost efficiency variance for October 2005.
- Calculate the operating variable processing cost expenditure and efficiency variances for October 2005.
- Using your answer to parts (a), (b) (i) and (b) (ii) above, prepare a statement that reconciles the original variable standard cost of the actual output to the actual variable cost incurred in October 2005 and clearly shows the planning and operative variances.
(Work to the nearest Rs.1.)
- Explain the importance of separating variance into their planning and operation components for the purpose of management control.

BALANCE SCORECARD: Variance analysis**1. Growth Component:**

(a) Revenue effect = (Actual Output sold – Budgeted Output sold) Bud. Price/ unit

(b) Cost effect = (Budgeted Input – Budget Input for Actual Output) Budgeted rate

Note : In case items of fixed cost nature , Budgeted Input for Actual Output = the Budget amount.

2. Price Recovery Component:

(a) Rev. effect = (Actual Price – Budgeted Price) Actual Output sold

(b) Cost effect = (Budgeted Rate – Actual Rate) Budgeted Input for Actual Output

3. Productivity Component = (Bud. Input for Actual Output- Actual Input) × Actual Rate

Note: Actual profit = budgeted profit + adjustment of the above 3 items

- 39.** Following a strategy of product differentiation, Westwood Corporation makes a high-end Kitchen range hood, KE8. Westwood's data for 2005 & 2006 follows:

	2005	2006
1. Units of KE8 produced & sold	40,000	42,000
2. Selling price	Rs. 100	Rs. 110
3. Direct Materials (Sq. feet)	1,20,000	1,23,000
4. Direct material costs per Sq. foot	Rs. 10	Rs. 11
5. Manufacturing capacity for KE8 (units)	50,000	50,000
6. Conversion costs (Rs.)	10,00,000	11,00,000
7. Conversion costs per unit of capacity (Rs.)	20	22
(Row 6 ÷ Row 5)		
8. Selling and customer service capacity	30 customer	29 customers
9. Selling & customer service costs (Rs.)	7,20,000	7,25,000
10. Cost per customer of selling & customer		
Service capacity (Row 9 ÷ Row 8) (Rs.)	24,000	25,000

Westwood produced no defective units and reduced direct material usage per unit of KE8 in 2006. Conversion costs in each year are tied to manufacturing capacity. Selling & customer-service costs are related to the number of customers that the selling & service functions are designed to support.

Required:

- Describe briefly the elements you would include in Westwood's balanced scorecard.
- Calculate the growth, price-recovery, and productivity components that explain the change in operating income from 2005 to 2006.

3. Suppose during 2006, the market size for high-end Kitchen range hoods grew at 3% in terms of number of units and all increases in market share (that is, increases in the number of units sold greater than 3%) are due to Westwood's product differentiation strategy. Calculate how much of the change in operating income from 2005 to 2006 is due to the industry-market-size factor, cost leadership, and product differentiation.

BENCH MARK : Variance Analysis :

40. The actual performance of two companies during 2006:

	<u>X & Co.</u>	<u>Y & Co.</u>
Output (units)	600	1,000
Material consume (Kg.)	1,200	2,100
Rate per kg. (Rs.)	8	8.10

The actual performance for 2007 were:

	<u>X & Co.</u>	<u>Y & Co.</u>
Output (units)	680	950
Material consumed (Kg.)	1,400	1,860
Rate per kg. (Rs.)	8.58	8.50

Material price was increased by 6% in 2007 due to International Shortage of material.

- (i) Identify the Benchmark for 2007
- (ii) Analyse the performance of 2007
- (iii) Find Benchmark for 2008.