!!JAI SARASWATI MATA!!

CA FINAL (NEW) COURSE
PAPER V

ADVANCED MANAGEMENT ACCOUNTING
(Theory)

(As per the latest syllabus of Final issued by Board of Studies of ICAI)

For AMA (Cost + QT.) Classes by CA CS Pankaj Gupta Sir:

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- A comprehensive book on Advanced Management Accounting for Final Examination of ICAI.
- Contains – Questions from Past Examinations mentioned in bracket of each questions.
- Contains – Questions from Study Material which has chance to come.
- Contains – Questions from Revision Test Papers which has chance to come.
- Contains – Questions from Practice Manual which has chance to come.
- Please bring to my notice any discrepancies you can find in the book.
- Hope you have as much fun reading the book as we have had preparing for it!

- Pankaj Gupta (ACA, CS)

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He is graduate from University of Calcutta in the year 2007 and achieved the feat of being one of the toppers of his college. Along with graduation, he joined the Chartered Accountancy and Company Secretary Course. He cleared all the stages of CA and CS Course in his first attempt. He has always stood as a meritorious student in all the stages of Chartered Accountancy Course. He qualified as a Chartered Accountant in the year 2009. He has scored a sound 90% in Accountancy Paper in PE – I and PE – II of CA. His favourite subjects during his academic have been Costing and Mathematics. His passion for teaching and students' keen interest for his classes drove him to take teaching as a career. He is a well known faculty having specialization in the field of cost accounting (CA IPCE subject) and Advanced Management Accounting (CA Final subject). He has tried and been so far successful in making a student comfortable with the subject dynamics thus helping student leverage through his knowledge depth and his will to help a student succeed.

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ADVANCED MANAGEMENT ACCOUNTING
CA FINAL (THEORY)

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Basic Concept

1. What is cost & cost accounting?
Answer: Cost is measurement, in monetary terms, of the amount of resources used for the purpose of production of goods or rendering services.

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."

2. Enumerate the main objectives of introduction of a Cost Accounting System in a manufacturing organization.
Answer: The main objectives of introduction of a Cost Accounting System in a manufacturing organization are as follows:

a. Ascertainment of cost
b. Determination of selling price
c. Cost control and cost reduction
d. Ascertainment of profit of each activity
e. Assisting in managerial decision-making

3. How has the composition of manufacturing costs changed during recent years? How has this change affected the design of cost accounting systems?
Answer: Traditionally, manufacturing companies classified the manufacturing costs to be allocated to the products into (a) direct materials. (b) direct labour and (c) indirect manufacturing costs. In the present day context, characterised by intensive global competition, large scale automation of manufacturing process , computerization and product diversification to cater to the changing consumer tastes and preferences has forced companies to refine their costing systems to provide better measurement of the overhead costs used by different cost objects.

Accordingly, manufacturing costs are classified in to three broad categories as under:

i. **Direct cost:** As many total costs relating to cost objects as feasible are classified into direct cost. The objective is to trace as many costs as possible in to direct and to reduce the amount of costs classified into indirect because the greater the proportion of direct costs the greater the accuracy of the cost system.

ii. **Indirect cost pools:** Increase the number of indirect cost pools so that each of these pools is more homogeneous. In a homogeneous cost pool, all the costs will have the same cause-and-effect relationship with the cost allocation base.

iii. Use cost-and-effect criterion for identifying the cost allocation base for each indirect cost pool. The change in the classification of manufacturing costs as above has lead to the development of Activity Based Costing (ABC). Activity Based Costing refines a costing system by focusing on individual activities as the fundamental cost objects. An activity is an event, task or unit of work with a specified purpose as for example, designing, set up, etc. ABC system calculates the costs of individual activities and assigns costs to cost objects such as products or services on the basis of the activities consumed to produce the product or provide the service.

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4. "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 behaviour:** According to this classification costs are classified as fixed; variable and semi variable costs. Fixed costs can be further classified as committed and discretionary fixed cost.

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.

5. Explain the concept of Discretionary Fixed Costs and Committed Fixed Costs. Give three examples. Discuss, how control may be exercised over discretionary costs. (Nov'1999)

Answer: Discretionary fixed 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 & affect relationship between inputs & outputs.

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

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

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.

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-settings

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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.

6. What do you mean by Cost Control and Cost Reduction and their differences?
Answer:
Cost control implies guidance a reputation of cost by executive action. For this purpose, the executives are provided with some yard stick such as standards or budgets with which the actual costs and performances are compared to ascertain the degree of achievement made. Therefore Cost Control involves a continuous comparisons of actual with the standards or budgets to regulate the former. Standards or budgets once set up are not attended during the period or until some mistakes are discovered in standards.

Cost reduction is the achievement of real and permanent reduction in unit cost of products manufactured. It, therefore, continuously attempts to achieve genuine savings in cost of production distributing, selling and administration. It does not accept a standard or budget as or fined. It rather challenges the standards/budgets continuously to make improvement in them. It attempts to excavate, the potential savings buried in the standards by continuous and planned efforts. Cost control relax that dynamic approach, it usually dealt with variances leaving the standards intact.

Difference between cost control and cost reduction :-

i. Cost Control is defined as the "the guidance and regulations by executives action of the cost of operating and undertaking while cost reduction is defined as and achievement of real and permanent reduction in the unit cost of goods manufactured or services rendered without impairing their suitability for the use intended."

ii. Thus the cost control represents the efforts where cost reduction represents achievement. Cost reduction is a continuous attempt towards improvement.

iii. Cost Control implies that cost should not exceed the budgeted or standard limits. If it exceeds, investigation is necessary. Cost reduction means waste reduction, expenses reduction and increased production.

iv. The process of cost control is to set a target ascertain actual performance and compare it with the target, investigate the variances and take remedial measures. Cost reduction is not concerned with maintenance of performance according to the standards. Cost control assumes existence of standards or which are not challenged. Cost reduction assumes the existence of concealed potential savings in the standards or norms which are, therefore subjected to a constant challenge with a view to improvement by bringing out the saving.

v. Cost control is a preventive function, costs are optimised before they are incurred. Cost reduction is a corrective functions. It operates even when an efficient cost control system exists. There is room for reduction in the achieved cost under controlled conditions.

7. Illustrate some of the Cost reduction techniques?
Answer: It may be extended to administrative, selling and distribution methods, personnel management, purchase and material control, financial management and other mischevious services. Tools and techniques for cost reduction :-

- Budgetary control and standard cost.
- Value analysis.

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- Standardisation.
- Economic batch quantity (E. B. Q.)
- Coding and classification.
- Improvement in design.
- Substitute material utilisation.
- Automation.
- Operational Research.
- Quality Control.
- Production Planning and Control.
- Inventory Control.
- Purchase Scheduling .
- Training and development.

8. Explain the "Application of cost control in material cost"?
Answer: Materials Cost is the price paid and the cost incurred by an organization in procuring materials for production. If material cost is effectively controlled we must have a proper system of material control and the following are the fundamental requirement of such a control :-

i. Definite responsibility in respect of every function of material control should be specified and allocated.

ii. Proper co-ordination between the various sections/departments responsible for different function should be achieved.

iii. Purchasing function should be centralised as far as possible and entrusted to a competent person conversant with purchasing function.

iv. Controlled procedure should be standardised ad uniform forms and documents should be used all over the organisation.

v. To facilitate the control procedures materials requirements budget and materials purchased budget should be prepared.

vi. Adequate provision for proper storage facilities and suitable arrangements for storing materials should be made.

vii. A proper system of stock control should be introduced and maintained.

9. "Cost can be managed only at the point of commitment and not at the point of incidence. Therefore it is necessary to manage cost drivers to mange cost." Explain the statement with reference to structural and executional cost drivers. (Nov'07)
Answer: A firm commits costs at the time of designing the product and deciding the method of production. It also commits cost at the time of deciding the delivery channel (e.g. delivery through dealers or own retail stores). Costs are incurred at the time of actual production and delivery. Therefore, no significant cost reduction can be achieved at the time when the costs are incurred. Therefore, it is said that costs can be managed at the point of commitment. Cost drivers are factors that drive consumption of resources. Therefore, management of cost drivers is essential to manage costs.

Structural cost drivers are those, which can be managed by effecting structural changes. Examples of structural cost drivers are scale of operation, scope of operation (i.e. degree of vertical

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integration), complexity, technology and experience or learning. Thus, structural cost drivers arise from the business model adopted by the company.

Executional cost drivers can be managed by executive decisions, examples of executional cost drivers are capacity utilization, plant layout efficiency, product configuration and linkages with suppliers and customers. It is obvious that cost drivers can be managed only at the point of structural and operating decisions, which commit resources to various activities.

10. Discuss with examples, the basic costing methods to assign costs to services. (May'07)
Answer:
Job costing method: The cost of a particular service is obtained by assigning costs to a distinct identifiable service. e.g. Job Costing method is used in Service Sectors- like Accounting Firm, Advertisement campaign.

Process Costing Method: Cost of a service is obtained by assigning costs to masses of similar unit and then computing cost/ unit on an average basis. E.g. Retail banking, postal delivery, credit card etc.

Hybrid Method: Combination of both (i) & (ii) above.

11. Critically examine "It is prudent to hold large inventories in an inflationary economy". (Nov'05)
Answer: In an inflationary economy, prices rise rapidly. Holding large inventories will affect the inventory carrying cost including interest on funds blocked. However, there are other risks like obsolescence, deterioration in quality, limited shelf-life in case of certain materials etc. In addition to these risks, cheaper substitutes may be available at a later date. New sources of supply may be available at competitive rate or else price may fall. Hence speculation should be avoided.

The funds so blocked may be invested for expansion or diversification, which may result into higher profitability than the benefit arising from holding large inventory. Hence normal level of inventory may be held to avoid stock-out leading to loss of production. In view of above points all inventory control techniques may be applied for deciding the amount to be invested in inventory. Inflationary economy is one factor. There are several other considerations for deciding the quantum of inventory.

12. State three applications of direct costing. (May 2001)

Answer: Three applications of direct costing are as follows:

i. Stock valuation
ii. Minimum quantity to be produced to recover pattern or mould cost,
iii. Close down decisions – like closing down of a department or shop.

13. Outline the key attributes of an operational database
Answer: The key attributes of an operational database are:

(a) Consistency of related information elements: Operating personnel are alert for information that is in consistent 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.

(b) 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.

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(c) 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.

(d) 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.

14. State the characteristic features of a database created for operational control and decision making. (Nov'08)

Answer: The characteristic features of a data-base created for operational control and decision making are as under:

i. There should be a file structure that facilitates the association of one internal record with other internal records.

ii. There should be cross functional integration of files.

iii. Independence of program / data file for ease of updating and maintenance of data base.

iv. There must be common standards throughout with respect to data definitions, record formats and other data descriptions.

v. A data dictionary should be available.

15. Classify the following items under the more appropriate category.
Category (CC) – Cost Control OR Category (CR) – Cost Reduction (May'12)

i. Costs exceeding budgets or standards are investigated.
ii. Preventive function
iii. Corrective function
iv. Measures to standardize for increasing productivity
v. Provision of proper storage facilities for materials
vi. Continuous comparision of actual with the standards set.
vii. Challenges the standards set.
viii. Value Analysis

Answer: Classification of items under cost control / cost reduction

i. Cost Control;	ii. Cost Control
iii. Cost Reduction;	iv. Cost Reduction
v. Cost Control;	vi. Cost Control
vii. Cost Reduction;	viii. Cost Reduction

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Budgetary Control & Performance Measurement

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

Answer: 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.

Essential features:

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.

Objective :

i. 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.

ii. The budget serves as a **declaration of policies** and also defines the objective for executives at all levels of management.

iii. 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.

iv. 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.

v. Budgets facilitate **centralised control** with delegated authority and responsibility. Grouped according to the responsibilities of different executive levels, they facilitate decentralisation of work.

vi. 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

i. the establishment of budgets relating the responsibilities of executives to the requirements of a policy and

ii. 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.

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It follows that a budgetary control system secures control over performances and related costs in different parts of a business by establishing budgets, comparing actual attainments against the budgets, and taking corrective action and remedial measures or revision of the budgets, if necessary.

Limitations of Budgetary Control System:

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

i. Budgets are considered as rigid document.

ii. Budgets cannot be executed automatically

iii. staff co – operation is usually not available during budgetary control exercise.

iv. Its implementation is quite expensive.

Components of budgetary control system (June'09)

The policy of a business for a defined period is represented by the master budget the details of which are given in a number of individual budgets called functional budgets. The functional budgets are broadly grouped under the following heads:

i. Physical Budgets – Sales Qty, Product Qty., Inventory, Manpower budget.

ii. Cost Budgets – Manufacturing Cost, Administration Cost, sales & distribution cost, R & D Cost.

iii. Profit Budget

2. What is Programme Budget? State its process

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 : --

i. 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.

ii. Program budgeting is prospective; the other types of budget are retrospective. Program budgeting connotes planning in the real sense.

iii. 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.

iv. 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.

v. Program budgeting is closely associated with social cost-benefit (SCBA) analysis.

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The process of program budgeting consists of the following three stages:

(a) Programming Accounting : A program is collection of activities that have the same purpose and function together to produce the same output. For instance in a programme of Personal Safety. Law and order enforcement may be a sub-programme that may be further expanded into a number of activities such as prevention of crime, detection and investigation of crime, judiciary for judging and awarding punishment, and jail administration.

Program accounting has a twofold function, viz.

i. to define a number of programs and list aggregate expenditure accounting to the programs they serve, and

ii. to ascertain all the expenses including capital outlays that are chargeable to each program.

(b) Multiyear Costing : This focuses on the total cost of a program that may not run just for one financial year only but may continue for a number of years ahead, Thus a program budget will show estimated costs for the current budget year as well as for several future years to cover the entire life of a program-or-project.

(c) Description and measurement of activities: The procedures in this phase are as follows : -

i. Description ;
ii. Determination of objectives, i.e. the long term goals (for example, providing for agriculture Improvement, establishment of industrial estates etc.)
iii. Decide upon a course of action ;
iv. Consider the alternatives rejected in preference to the choice action;
v. Determine the output;
vi. Measure the effectiveness i.e. the degree to which objectives or targets have been achieved.

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 and correlating the physical and financial aspect of the individual items comprising the budget.

Traditional budgeting vs. Performance budgeting

i. 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.

ii. 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 PBlatter 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.

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Steps in PB

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

i. establishing a meaningful functional programme and activity classification of government operations ;

ii. bring the system of accounting and financial management in accord with this classification ;

iii. evolving suitable norms, yardsticks, work units of performance and units costs, wherever possible under each programme and activity for their reporting and evaluation.

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

i. the objectives of the enterprise are spelt out in concrete terms.

ii. the objectives are then translated into specific functions, programmes, activities and tasks for different levels of management within the realities of fiscal; constraints ;

iii. realistic and acceptable norms, yardsticks or standards and performance indicators should be evolved and expressed in quantifiable physical units. ;

iv. a style of management based upon decentralised responsibility structure should be adopted, and

v. an accounting and reporting system should be developed to facilities monitoring, analysis and review of actual performance in relation to budgets.

4. What is Functional Budget?
Answer :
A Functional budget is prepared according to the various functions of the organization
e.g.:- Sales, Production, Administration research & development etc. Following are the most popular functional budget:

1. Sales budget
2. Production budget
3. Materials budget
4. Labour budget
5. Manufacturing overhead budget
6. Administrative cost budget
7. Plant utilization budget
8. Research and Development budget
9. Capital expenditure budget
10. Cash budget

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

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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 OR Advantages of ZBB. (Nov'08)

- 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.

6. Describe the process and limitation of zero-base budgeting. (May'07, Nov'10)
Answer: The zero base budgeting involves the following steps:

i. Corporate objectives should be established and laid down in details.
ii. Decide about the techniques of ZBB to be applied.
iii. Identify those areas where decisions are required to be taken.
iv. Develop decision programme and rank them in order of performance.
v. Preparation of budget, that is translating decision packages into practicable units/ items and allocating financial resources.

<u>Limitations of ZBB</u> (Nov'08)

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

7. Write short note on 'Zero Base Budgeting as an approach towards productivity improvement.' (Nov'05)
Answer: Zero Base Budgeting (ZBB) is an expenditure control device where without reference to the past budget figures or achievements each division head has to justify the requirement of funds for each head of expenditure and prepare the budget accordingly. ZBB is defined as "An operating, planning and budgeting process which requires each manager to justify the entire budget request in details from scratch (hence zero base) and shifts the burden of proof to each manager who has to justify why he should spend any money at all."

ZBB provides a basis for evaluating decision package on basis of cost-benefit considerations. It focuses attention on output in relation to value of money. It reduces inefficiency and achieves high level of effectiveness. It can be applied to cost reduction programmes. Scarce resources can

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be utilised effectively. Ineffective entries are eliminated and duplicate activities are easily identified. Thus wasteful expenditure is reduced or eliminated fully. It leads to increase in staff participation creating greater motivation and job satisfaction. All these aspects will ultimately result in greater productivity of the resources and organization performance by way of higher profit or lower costs.

8. 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.

9. What are the various formulae used in calculating budget ratios? (June'09)
Answer: Type of budgeted ratio used are:

i. Efficiency Ratio = (Standard hours / Actual hours) * 100

ii. Activity Ratio = (Standard hours / Budgeted hours) * 100

iii. Calendar Ratio = (Available working days / budgeted working days) * 100

iv. Standard Capacity Usage Ratio (Budgeted hours / Max. possible hours in the budgeted period) * 100

v. Actual Capacity Usage Ratio = (Actual hours worked / Maximum possible working hours in a period) * 100

vi. Actual usage of Budgeted Capacity Ratio = (Actual working hours / Budgeted hours) * 100

10. Benchmarking

Definition
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.

Types of benchmarking :
a. intra-group and
b. inter-industry.

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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.

The steps in benchmarking

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.

Types of measurement

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

11. What are the Bench marking code of conduct (Nov'08, May'10)

Answer: 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

12. What are the Pre-requisites of Bench marking?

Answer:

i. The objectives of bench marking should be clearly defined.

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ii. Senior Managers should support bench marking and commit themselves for continuous improvement.

iii. The scope of the work should be appropriate in the light of the objectives, resources, time and experience of those involved.

iv. Sufficient resources should be made available to complete projects within the required time.

v. Bench marking teams should have the right skill and competencies.

vi. Stake holders, staff & others should be kept informed of the reasons of bench making

13. Explain briefly stages involved in the process of Bench marking? (Nov'09, May'11)

Answer: The process of benchmarking requires a Company to identify the areas i.e. processes, activity etc. which are central to its business and then selects the top-performing companies in those areas. The benchmarking process is comprised of following stages. These stages are:

a. Planning:

i. Determination of benchmarking goal statement: This requires identification of areas to be benchmarked. In practice, one should start with the identification of those areas which have to be really good to be really successful.

ii. Identification of best performance: Once the benchmarked goal statement are defined, the step is seeking the best of the breed of best of the best.

iii. Establishment of the benchmarking or process improvement team: Ideally this should include the persons who are most knowledgeable about the internal operations and will be directly affected by changes due to benchmarking.

iv. Defining the relevant benchmarking measurement: Relevant measures will not include the measures used by the organisation today but they will be refined measures that comprehend the true performance differences.

b. Collection of data and information:

The data gathering for benchmarking could be done through national/international clearing houses, mail surveys, suppliers, company visits, telephone, interviews etc. In recent years national and international clearing houses have been set up.

c. Analysing the findings: The analysing of finding of step (2) requires following:

i. Review the findings and produce tables, charts and graphs to support the analysts.

ii. Identify gaps in performance between our organisation and better performers.

iii. Seek explanations for the gaps in performance. The performance gaps can be positive, negative or zero.

iv. Ensure that comparisons are meaningful and credible.

v. Communicate the findings to those who are affected.

vi. Identify realistic opportunities for improvements.

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d. Recommendations: This involves:

i. Deciding the feasibility of making the improvements in the light of the conditions that apply within own organisation.

ii. Agreement of the improvements that are likely to be feasible.

iii. Producing a report on the Benchmarking in which the recommendations are included.

iv. Obtaining the support of key stakeholder groups for making the changes needed.

v. Developing action plan(s) for implementation.

e. Monitoring and reviewing: This involves:

i. Evaluating the benchmarking process undertaken and the results of the improvements against objectives and success criteria plus overall efficiency and effectiveness.

ii. Documenting the lessons learnt and make them available to others.

iii. Periodically re-considering the benchmarks

14. The theory of constraints (TOC) & Throughput accounting:

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

The steps in managing bottleneck operations:

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 emphasizes 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.

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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.

Sales revenue - 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 :

- 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.

15. Explain the concept and aim of theory of constraints. What are the key measures of theory of constraints? (May'08)

Answer: The theory of constraints focuses its attention on constraints and bottlenecks within organisation which hinder speedy production. The main concept is to maximize the rate of manufacturing output is the throughput of the organisation. This requires to examine the bottlenecks and constraints. A bottleneck is an activity within the organization where the demand for that resource is more than its capacity to supply.

A constraint is a situational factor which makes the achievement of objectives /throughput more difficult than it would otherwise, for example of constraint may be lack of skilled labour, lack of customer orders, or the need to achieve high quality in product output.

For example let meeting the customers' delivery schedule be a major constraint in an organisation. The bottleneck may be a certain machine in the factory. Thus bottlenecks and constraints are closely examined to increase throughput.

Key measures of theory of constraints:

i. **Throughput contribution:** It is the rate at which the system generates profits through sales. It is defined as, sales less completely variable cost, sales – direct are excluded. Labour costs tend to be partially fixed and conferred are excluded normally.

ii. **Investments:** This is the sum of material costs of direct materials, inventory, WIP, finished goods inventory, R & D costs and costs of equipment and buildings.

iii. **Other operating costs:** This equals all operating costs (other than direct materials) incurred to earn throughput contribution. Other operating costs include salaries and wages, rent, utilities and depreciation.

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

16. Distinction between Fixed and Flexible Budget:

Fixed Budget	Flexible Budget
1. It does not change with actual volume of activity achieved. Thus it is known as rigid.	**1.** It can be re-casted 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.	**2.** 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.	**3.** 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	**4.** 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.	**5.** It provides a meaningful basis of compari - sion of the actual performance with the budgeted targets.

17. What do you mean by a flexible budget? Give an example of an industry where this type of budget is typical needed? (May'08)

Answer: A flexible budget is defined as "a budget which, by recognizing the difference between fixed, semi-variable and variable cost is designed to change in relation to the level of activity attained". A fixed budget, on the other hand is a budget which is designed to remain unchanged irrespective of the level of activity actually attained. In a fixed budgetary control, budgets are prepared for one level of activity whereas in a flexibility budgetary control system, a series of budgets are prepared one for the each of a number of alternative production levels or volumes. Flexible budgets represent the amount of expense that is reasonably necessary to achieve each level of output specified. In other words, the allowances given under flexibility budgetary control system serve as standards of what costs should be at each level of output.

E.g. seasonal products – e.g. soft drink industry
industries in make to order business like ship building
industries influenced by change in fashion.
industries which keep on introducing new products / new designs

18. Define Balanced Scorecard. Explain briefly the major components of a balance score card. (May'07, May'06, Nov'10, May'12)

Answer: 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

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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 :

i. **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.

ii. **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.

iii. **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.

iv. **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.

19. Explain goals and performance measure for each perspective of Balance Score Card. (June 09)
Answer:

Goals and performance measures for each perspective of balance scorecard.

Customer Perspective

Goals	**Performance Measures**
Price	Competitive price

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Delivery	Number of on time delivery, lead time from receipt of order to delivery to customer.
Quality	Own quality relative to industry standards, number of defects or defect level.
Support	Response time, customer satisfaction survey.

Internal Business Perspective

Goals	**Performance Measures**
Efficiency of manufacturing Process	Manufacturing cycle time
Sales penetration	Sales plan, Increase in number of customer in a unit of time.
New Product introduction	Rate of new product introduction.

Innovation and Learning Perspective

Goals	**Performance Measures**
Technology leadership	Performance of product, use of technology
Cost leadership	Manufacture overhead per quarter
Market leadership	Market share in all major markets
Research and development	Number of new products, Patents

Financial Perspective

Goals	**Performance Measures**
Sales	Revenue and profit growth
Cost of Sales	Extent in remain fixed or decreased each year
Profitability	Return on capital employed
Prosperity	Cash flows

20. "In many organizations, initiatives to introduce balanced score card failed because efforts were made to negotiate targets rather than to build consensus."
Required:
Elucidate the above statement. (Nov'07)
Answer: Balanced score card is a set of financial and non-financial measures relating to a company's critical success factors. It is an approach which provides information to management to assist in strategy implementation. Therefore, the components to be included in the balanced score card must flow from strategy. The targets should be measurable and must flow from strategy and corporate plan of the company. It is necessary that managers should agree to the components and targets because in absence of a consensus, managers may not commit to the targets established by the top management / the board of directors. Moreover, the functions are interdependent and results in one functional area/perspective (e.g. innovation and learning) have direct bearing on the results in other functional area / perspective (e.g. customer perspective). Therefore, it is not sufficient that individual managers agree to their targets. Successful

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implementation requires that the top management builds an overall consensus on the components and targets of the balanced score card. Negotiation undermines the fundamental principle that the components and targets should flow from strategy. As a result, an approach to establish targets through negotiation defeats the very purpose of balanced score card.

21. What are the elements of a Balanced Score Card? Also explain, how it can be used as a Financial Planning model. (May'06, Nov'05)

Answer: The elements of a balanced score card are:

i. Financial perspective - Sales / Cost of sales / Return on capital employed etc.
ii. Customer perspective - Measures of price / delivery / quality / support
iii. Internal perspective - Measures of efficiency / sales penetration and new product introduction
iv. Learning & Growth perspective. - Measures of technology / cost leadership

The objective of the balance score card is to provide a comprehensive framework for translating the company's strategic objectives into a coherent set of performance measures. It emphasizes the use of financial and non-financial measures as part of the programme to achieve further performance. It helps in planning, setting targets and aligning strategic initiatives.

To evaluate the success of the implementation of strategy, the company can assess the change in the operating income by comparing the targeted operating income with the actual operating income. The change in the operating income may arise due to growth factor, change in the price of inputs and outputs and productivity factor. The company is said to successful in implementation of strategy only if the change in the operating income closely aligns with that strategy.

22. List the eight functional budgets prepared by a business. (Nov'09)

Answer: The various commonly used Functional budgets are:

- Sales Budget
- Production Budget
- Plant Utilisation Budget
- Direct Material Usage Budget
- Direct Material Purchase Budget
- Direct Labour (Personnel) Budget
- Factory Overhead Budget
- Production Cost Budget

23. Distinction or differences between budgets and standard are shown as follows :-

	Budget.	**Standard.**
1.	**Understanding :**	
a)	It provides a summarised picture of results to be expected from a proposed plan of operations.	**a)** It provides a base for measurement implying what is proper and adequate for a given purpose.
b) i)	It is comprehensive in nature and envelops several operation.	**b) i)** It relates to a specific limited operation.
ii)	Budgets are complete in as much as they are framed for all the activity and function of concern such as production, Purchase, Selling and Distribution, Research and Development Capital Utilisation etc.	**ii)** Standards relate only to the function of the production and the related manufacturing cost.

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iii) Budgets are adherence to which keeps a business out of difficulties	**iii)** Standards are pointer to further possible improvement.
c) It is based on futuristic. For ex. from past experience adopted to changing circumstances in a defined period of time.	**c)** It is based on scientific predetermination of an attainable good performance level and does not necessarily relate to a specific period of time.
2. Scope :	
a) It includes overall system 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.
3. Objective ; 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.
4. Acceptance ; For control purpose of management, acceptance is easier through executives participation in establishment.	Establishment is based on scientific assesment and management authority. Acceptance, particularly related to labour, is comprehensively more difficult.
5. Review : 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.
6. Variance Analysis : Usually involves a lesser degree of analysis on overall basis.	Analysis is detailed and casual relationship with specific functions are established.

24. "Balanced score card and performance measurement system endeavours to create a blend of strategic measures, outcomes and drive measures and internal and external measures". Discuss the statement. (Nov'04)

Answer: The balanced score card translates an organization's mission and strategy into a comprehensive set of performance measures that provides the framework for implementing its strategy. The balanced score card does not focus solely on achieving financial objectives. It is an approach, which provides information to management to assist in strategic policy formulation and achievement. It emphasizes the need to provide the user with a set of information, which addresses all relevant areas of performance in an objective and unbiased manner. As a management tool it helps companies to assess overall performance, improve operational processes and enables management to develop better plans for improvements.

25. "Because a single budget system is normally used to serve several purposes, there is a danger that they may conflict with each other". Do you agree? Discuss.

Answer: A single budget system may be conflicting in planning and motivation, and planning and performance evaluation roles as below:

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i. **Planning and motivation roles –** Demanding budgets that may not be achieved may be appropriate to motivate maximum performance but they are unsuitable for planning purposes. For these, a budget should be a set based on easier targets that are expected to be met.

ii. **Planning and performance evaluation roles -** For planning purposes budgets are set in advance of the budget period based on an anticipated set of circumstances or environment. Performance evaluation should be based on a comparison of active performance with an adjusted budget to reflect the circumstance under which managers actually operated.

26. Describe the four types of bench marking of critical success factors. (Nov'08)
Answer: The Benchmarking is of following types:

i. **Competitive benchmarking:** It involves the comparison of competitors products, processes and business results with own.

ii. **Strategic benchmarking:** It is similar to the process benchmarking in nature but differs in its scope and depth.

iii. **Global benchmarking:** It is a benchmarking through which distinction in international culture, business processes and trade practices across companies are bridged and their ramification for business process improvement are understood and utilized.

iv. **Process benchmarking:** It involves the comparison of an organisation critical business processes and operations against best practice organization that performs similar work or deliver similar services.

v. **Functional Benchmarking or Generic Benchmarking:** This type of benchmarking is used when organisations look to benchmark with partners drawn from different business sectors or areas of activity to find ways of improving similar functions or work processes.

vi. **Internal Benchmarking:** It involves seeking partners from within the same organization, for example, from business units located in different areas.

vii. **External Benchmarking:** It involves seeking help of outside organisations that are known to be best in class. External benchmarking provides opportunities of learning from those who are at the leading edge, although it must be remembered that not every best practice solution can be transferred to others.

25 Marks Theory surely come from this material

Absorption Costing: first technique of pricing

1. "The use of Absorption Costing method in decision-making process leads to anomalies." Discuss. (May'06)

Answer: In absorption costing, fixed overheads are assigned to products by establishing overhead absorption rates based on budgeted or normal output. By using absorption costing principles, it is possible for profit to decline when sales volume increases. If the stock levels fluctuate significantly, profits may be distorted because stock changes will significantly affect the amount of fixed overheads allocated to a period. If profits are measured on monthly or quarterly or on periodical basis, seasonal variations, in sales may causes significant fluctuations in profits.

Internal profit statements on monthly or quarterly basis are used for measuring the managerial performance. In the circumstances, managers may deliberately alter inventory levels to influence profit, if absorption costing is used. When sales are less and the closing inventory increases, a part of the fixed overheads contained in the value of the closing stock is reduced from the fixed costs allocated to production for the period. Thus, if sales are reduced, inventories will increase and absorption cost will past higher profits. Similarly, if sales are increased as compared to production, inventories will be reduced and absorption costing will return lower profits.

2. "Use of absorption costing method for the valuation of finished goods inventory provides incentive for over-production." Elucidate the statement. (May 2002)

Answer: When absorption costing method is used, production fixed overheads are charged to products and are included in product costs. Consequently, the closing stocks are valued on total cost (including fixed overheads) basis. The net effect is that the charge of fixed overheads to P/L account gets reduced, if the closing stock is greater than the opening stock. This situation has the effect of inflating the profit for the period.

Where stock levels are likely to fluctuate significantly, profits may be distorted if calculated on absorption costing basis. If marginal costing is used, since the fixed costs are charged off to P/L account as period cost, such a situation will not arise. The impact of using absorption costing on profits can be summarised as under:

- When sales are equal to production, profits will be the same under absorption costing and marginal costing.
- If production is higher than sales, the absorption costing will post higher profits that marginal costing.
- If sales are in excess of production, absorption costing will show lower profits than marginal costing.

Since profit calculation in absorption costing can produce strange result, the managers may deliberately alter the stock levels to influence the profits if absorption costing is used. Hence, it is true to say that if absorption costing method is used managers have the incentive to over produce to show better result.

25 Marks Theory surely come from this material

Activity Based Costing (ABC)

The emergence of ABC systems

During the 1980s the limitations of traditional product costing systems began to be widely publicised. These systems were designed decades ago when most companies manufactured a narrow range of products, and direct labour and materials were the dominant factory costs. Overhead costs were relatively small, and the distortions arising from inappropriate overhead allocations were not significant. Information processing costs were high, and it was therefore difficult to justify more sophisticated overhead allocation methods.

Today companies produce a wide range of products; direct labour represents only a small fraction of total costs, and overhead costs are of considerable importance. Simplistic overhead allocations using a declining direct labour base cannot be justified, particularly when information processing costs are no longer a barrier to introducing more sophisticated cost systems. Furthermore, the intense global competition of the 1980s has made decision errors due to poor cost information more probable and more costly. Over the years the increased opportunity cost of having poor cost information, and the decreased cost of operating more sophisticated cost systems, increased the demand for more accurate product costs. It is against this background that ABC has emerged. ABC, however, is nor a recent innovation. Fifty years ago Goetz (1949) advocated ABC principles.

SOME IMPORTANT DEFINITIONS

A Cost Object - It is an item for which cost measurement is required e.g. a product or a customer.

A Cost Driver - It is a factor that causes a change in the cost of an activity. There are two categories of cost driver:

- **A Resource Cost Driver -** It is a measure of the quantity of resources consumed by an activity. It is used to assign the cost of a resource to an activity or cost pool.
- **An Activity Cost Driver -** It is a measure of the frequency and intensity of demand, placed on activities by cost objects. It is used to assign activity costs to cost objects.

Activities: Activities comprise of units of work or tasks. For example, purchase of materials is an activity consisting a series of tasks like purchase requisition, advertisement inviting quotations, identification of suppliers, placement of purchase order, follow - up, etc.

Type of Activities: Activities basically fall into four different categories, known as the manufacturing cost hierarchy. These categories were first identified by Cooper in 1990 and help to determine the type of activity cost driver required. The categories are:

- **Unit level activities:** The costs of some activities (mainly primary activities) are strongly correlated to the number of units produced. For example, the use of indirect materials/consumables tends to increase in proportion to the number of units produced. Another example of a unit level activity is the inspection or testing of every item produced, if this was deemed necessary or, perhaps more likely, every 100th item produced.
- **Batch level activities:** The cost of some activities (mainly manufacturing support activities) are driven by the number of batches of units produced. Examples of this are :

25 Marks Theory surely come from this material

- Material ordering-where an order is placed for every batch of production
- Machine set-up costs-where machines need resetting between each different batch of production.
- Inspection of products-where the first item in every batch is inspected rather than every 100th item quoted above.
-

❖ **Product level activities:** The costs of some activities (often once only activities) are driven by the creation of a new product line and its maintenance, for example, designing the product, producing parts specifications and keeping technical drawings of products up to date. Advertising costs fall into this category if individual products are advertised rather than the company's name.

❖ **Facility level activities:** Some costs cannot be related to a particular product line, instead they are related to maintaining the buildings and facilities. Examples are the maintenance of buildings, plant security, business rates, etc. Also included in this category are salaries, such as the production manager's. Advertising campaigns that promote the organisation would also be included.

The first and last categories above are the same as those in traditional absorption costing and so if an organisation costs are mainly made up of these two categories ABC, will not improve the overhead analysis greatly. But if the organisation's costs fall mainly in the second and third categories an ABC analysis will provide a different and more accurate analysis.

Some important activities & cost driver :

Activity	Cost Driver
Machine set-up	Number of production runs Number of set up / set up hrs
Purchase materials	Number of orders placed Number of components
Warehousing	Items in stock / wt. / volume
Material handling	Number of parts or moves Number of material moves
Inspection	Inspection per item
Quality testing	Hours of test time
Receiving material	Number of receiving orders
Packing	Number of packing orders
Store delivery	Number of store deliveries
Line item ordering	Number of line items
Distribution	No. of customers Weight of items distributed

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Customer Service	Number of service calls. Hours spent on servicing product No. of Product serviced
Research & Development	Number of research projects Personal hours on a project Technical complexities of projects.
Engineering	Production order
Design of Products, services & processes	No. of products in design No. of parts per product No. of engineering hours
Marketing	No. of sales personnel No. of advertisement run Sales Revenue

The main steps are

Step 1 : Identify the chosen Cost Objects
Step 2 : Identify the Direct Costs of the Products
Step 3 : Select the Cost-Apportion Bases to Use for distributing Indirect Costs to the Products
Step 4 : Identify the Costs Associated with Each Cost-Allocation Base
Step 5 : Compute the Rate per Unit of Each Cost-Allocation Base Used to the Products
Step 6 : Compute the Indirect Costs Allocated to the Products
Step 7 : Compute the Total Costs of the Products by Adding All Direct and Indirect Costs

Activity Based Costing (ABC) (May'00)
It focuses on activities as the fundamental cost objects and uses the costs of these activities as building blocks for compiling the costs of other objects.

According to CIMA, it is defined as "Cost attribution to cost units on the basis of benefits received from indirect activities i.e. ordering, setting-up, assuring quality etc".

Under activity based costing costs are accumulated for each activity as a separate cost object. The collected costs are applied to products based on the benefits received from various activities. The final product costs are built up from the costs of the specific activities undergone. In the first stage the activity driven overhead cost is charged to activity based cost pools and in the second stage cost driver based rates are derived to charge cost to product lines. The cost driver based rates are based on activities.

Activities based costing can be used for:
(a) Pricing of products;
(b) Design and development of new products.

Benefits Of ABC
ABC is more expensive than the traditional system. So a cost-benefit analysis is desirable. The benefits of ABC are many.

25 Marks Theory surely come from this material

i. In ABC managers focus attention on activities rather than products because activities in various departments may be combined and costs of similar activities ascertained e.g. quality control, handling of materials, repairs to machines, etc

ii. Costs are identified with activities and then allocated to products or services, based on appropriate cost drivers. So more accurate product/service costs are obtained Since overhead or indirect costs occupies a significant proportion of the total costs of the firm, the overall impact of allocation of indirect costs to products/ services more accurately is significant.

iii. Managers manage activities and not products. Change in activities lead to changes in costs. Therefore, if the activities are managed well, costs will fall and resulting products will be more competitive.

iv. To manage activities better and to make wiser economic decisions, managers need to identify the relationships of activities and costs in a more detailed and accurate manner.

v. ABC highlights problem areas that deserve management's attention and more detailed analysis.

Weakness of ABC

ABC is not free from certain weakness. They are mentioned below:

i. ABC fails to encourage managers to think about changing work processes to make business more competitive.

ii. ABC does not conform to generally accepted accounting principles in some areas. For example, ABC encourages allocation of such non-product costs as research and development to products while committed product costs such as factory depreciation and not allocated to products.

iii. Using ABC for short-run decisions may sometimes prove costly in the long run. In a competitive environment (when other companies may be willing to meet the customers' needs); long term profits may suffer due to elimination of small orders.

iv. ABC does not encourage the identification and removal of constraints creating delays and excesses.

Activity Based Budgeting (ABB)

Brimson and John define activity-based budgeting as the process of planning and controlling the expected activities for the organisation to derive a cost-effective budget that meets forecast workload and agreed strategic goals. An activity-based budget is a quantitative expression of the expected activities of the firm, reflecting management's forecast of workload and financial and non-financial requirements to meet agreed strategic goals and planned changes to improve performance.

Thus, the key elements of ABB are:

- type of work/activity to be performed;
- quantity of work/activity to be performed; and
- cost of work/activity to be performed.

25 Marks Theory surely come from this material

ABB focuses on the activity/business processes. Resources required are determined on the expected activities and workload. The objective is to bring in efficiency into the system. So, in the process of budget preparation, many key questions, need to be addressed and properly answered

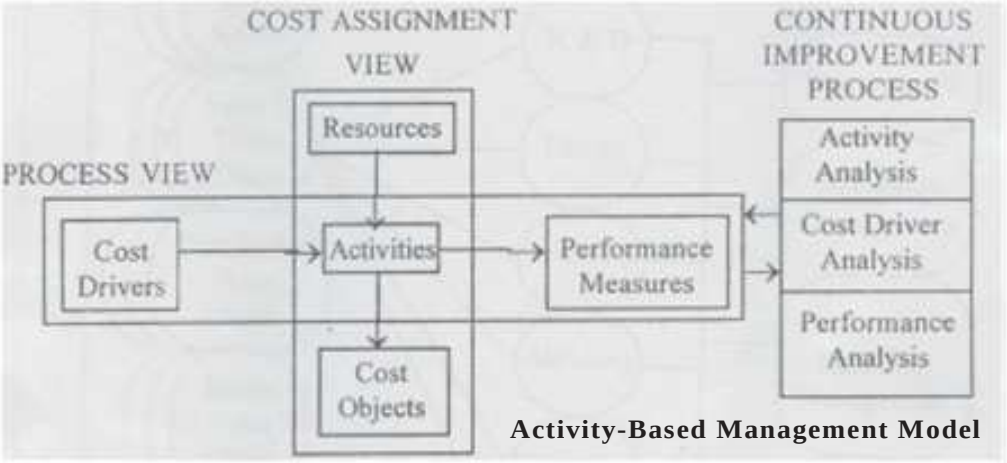
Activity Based Management (ABM)
Activity Based Management (ABM) is a further development on activity based costing (ABC).

ABC refers to cost attribution to cost units on the basis of benefit received from indirect activities e.g. material ordering, material handling, machine setups, quality assuring, customer support services etc. For each such activity, it is necessary to identify a cost driver that causes incurrence of cost relating to that activity. For example, hours spent on testing for a quality assurance activity may be used as application base of cost driver for this activity.

ABM analyses and manages cost drivers to manage costs. In that process ABM also analyses value added and non- value added activities in order to eliminate non-value added activities and simplify or improve upon value added activities.

ABM involves:

i. Identification of the major activity areas.
ii. Determination of the cost driver for each activity that may used as cost application base.
iii. Creation of cost pools for collection of activity costs having the same cost driver.
iv. Cost drivers link activities & resources consumption to generate less arbitrary costs for decision-making.



Activity-Based Management Model

1. What is the fundamental difference between Activity Based Costing system (ABC) and Traditional Costing system? Why more and more organizations in both the manufacturing and non-manufacturing industries are adopting ABC? (Nov'07)
Answer: In the traditional system of assigning manufacturing overheads, overheads are first allocated and apportioned to cost centres (production and support service cost centres) and then absorbed to cost objects (e.g. products). Under ABC, overheads are first assigned to activities or activity pools (group of activities) and then they are assigned to cost objects. Thus, ABC is a refinement over the traditional costing system. Usually cost centres include a series of different activities. If different products create different demands on those activities, the traditional costing system fails to determine the product cost accurately. In that situation, it becomes necessary to use different rates for different activities or activity pools.

The following are the reasons for adoption of ABC by manufacturing and non-manufacturing Industries:

i. Fierce competitive pressure has resulted in shrinking profit margin. ABC helps to estimate cost of individual product or service more accurately. This helps to formulate appropriate marketing / corporate strategy.

ii. There is product and customer proliferation. Demand on resources by products/ customers differ among product/ customers. Therefore, product/ customer profitability can be measured reasonably accurately, only if consumption of resources can be traced to each individual product / customer.

iii. New production techniques have resulted in the increase of the proportion of support service costs in the total cost of delivering value to customers. ABC improves the accuracy of accounting for support service costs.

iv. The costs associated with bad decisions have increased substantially.

v. Reduction in the cost of data processing has reduced the cost of tracking resources consumption to large number of activities

2. Given two examples for each of the following categories in activity based costing:
i) Unit level activities
ii) Batch level activities
iii) Facility level activities
iv) Product level activities **(Nov'06)**

Answer: Examples:

(i)	Unit level activities	(i)	Use of indirect materials
		(ii)	Inspection or testing of every item produced or say every 100th item produced
		(iii)	Indirect Consumables
(ii)	Batch level activities	(i)	Material ordering
		(ii)	Advertising costs, if advertisement is for individual products.
(iii)	Facility level activities	(i)	Maintenance of buildings
		(ii)	Plant security
		(iii)	Production manager's salaries
		(iv)	Advertising campaigns promoting the company.
(iv)	Product Level activities	(i)	Designing the product
		(ii)	Producing parts of certain specification

3. Why are conventional product costing systems more likely to distort product costs in highly automated plants? How do Activity-Based Costing system deal with such a situation? (May'06)

Answer: The conventional product cost system was in vogue when companies manufactured narrow range of products, overhead costs were relatively small and distortions arising from inappropriate overhead allocations were not significant. It used volume measures like direct labour hours or machine hours for charging overhead costs to products. In the case of a company using highly automated plant, direct labour is a small fraction of cost when compared with overheads (because of higher amount of depreciation). In case where such a company is multi product, overheads which are large in proportion to direct labour are influenced by number of set up, inspection, number of purchases etc. In these circumstances, the volume based method of recovery of overheads is no longer appropriate and such a measure will report inaccurate products

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costs. Hence, the traditional system of costing was found to over cost high volume products and under cost low volume products.

Activity Based Costing (ABC) system aims at refining the costing system used in automated plants in the following manner:

i. ABC systems trace more costs as direct costs.
ii. ABC systems create homogeneous cost pools linked to different activities.
iii. For each activity cost pool, ABC systems seek a cost allocation base that has a cause-and-effect relationship with costs in the cost pool.

4. How has the composition of manufacturing costs changed during recent years? How has this change affected the design of cost accounting systems? (May'06)

Answer: Traditionally, manufacturing companies classified the manufacturing costs to be allocated to the products into (a) direct materials. (b) direct labour and (c) indirect manufacturing costs. In the present day context, characterized by intensive global competition, large scale automation of manufacturing process, computerization and product diversification to cater to the changing consumer tastes and preferences has forced companies to refine their costing systems to provide better measurement of the overhead costs used by different cost objects. According, manufacturing costs are classified into the three broad categories as under:

i. Direct Cost: As Many total costs relating to cost objects as feasible are classified into direct cost. The objective is to trace as many costs as possible into direct and to reduce the amount of costs classified into indirect because the greater the proportion of direct costs the greater the accuracy of the cost system.

ii. Indirect cost pools: Increase the number of indirect cost pools so that each of these pools is more homogeneous. In a homogeneous cost pool, all the costs will have the same cause-and-effect relationship with the cost allocation base.

iii. Use cost-and-effect criterion for identifying the cost allocation base for each indirect cost pool.

The change in the classification of manufacturing costs as above has lead to the development of Activity Based Costing (ABC). Activity Based Costing refines a costing system by focusing on individual activities as the fundamental cost objects. An activity is an event, task or unit of work with a specified purpose as for example, designing, set up, etc. ABC system calculates the costs of individual activities and assigns costs to cost objects such as products or services on the basis of the activities consumed to produce the product or provide the service.

5. Explain the concept of activity based costing. How ABC system support corporate strategy? (Nov'05)

Answer: ABC is an accounting methodology that assigns costs to activities rather than products and services. This enables resources and overhead costs to be more accurately assigned to products and services that consume them when compared to traditional methods where either labour or machine hours are considered as absorption basis over cost centers. In order to correctly associate costs with products and services, ABC assigns cost to activities based on their resources. It then assigns cost to 'Cost object', such as products and customers, based on their use of activities. ABC can track the flow of activities in organization by creating a link between the activity and the cost objects.

ABC supports corporate strategy in many ways such as:

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- Information generated by ABC system can also encourage management to redesign the products.
- ABC system can change the method of evaluation of new process technologies, to reduce setup times, rationalization of plant lay out in order to reduce or lower material handling cost, improve quality etc.
- ABC system will report on the resource spending.
- ABC analysis helps managers' focus their attention and energy on improving activities and the actions allow the insights from ABC to be translated into increased profits.
- Performance base accurate feedback can be provided to cost center managers.
- Accurate information on product costs enables better decisions to be made on pricing, marketing, product design and product mix.

6. Explain the concept of cost drivers. Indicate what you will consider as cost drivers for the following business functions :

i) research and development; and

ii) customer service.

Answers : A cost driver is any factor whose change causes a change in the total cost of a related cost object. In other words, a change in the level of cost driver will cause a change in the level of the total cost of a related cost object.

The cost drives for business function viz., Research & Development and Customer Service are as below :

Business functions	**Cost drives**
Research & Development	- Number of research projects - Personal hours on a project - Technical complexities of projects.
Customer Service	- Number of service calls. - Hours spent on servicing product

7. What are the areas in which Activity based Information is used for decision making ? (Nov'00)

Answer: The areas in which Activity based Information is used for decision making are as under :

(i) Pricing
(ii) Market segmentation and distribution channels
(iii) Make-or-buy decisions and outstanding
(iv) Transfer pricing
(v) Plant closed down decisions
(vi) Evaluation of offshore production
(vii) Capital Investment decisions
(viii) Product line profitability

8. Differentiate between 'Value-added' and 'Non-value-added' activities in the context of Activity based costing.

Give examples of Value-added and Non-value-added activities.

Answer:

A value added activity is an activity that customers perceive as adding usefulness to the product or service they purchase. In other words, it is an activity that, if eliminated, will reduce the actual utility or usefulness which customers obtain from using the product or service. For example,

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painting a car in a company manufacturing cars or a computer manufacturing company making computers with preloaded software.

A non-value added activity is an activity where there is an opportunity of cost reduction without reducing the product's service potential to the customer. In other words, it is an activity that, if eliminated, will not reduce the actual or perceived value that customers obtain by using the product or service. For example, storage and moving of raw materials, reworking or repairing of products, etc.

Value-added activities enhance the value of products and services in the eyes of the organisation's customers while meeting its own goals. Non-value added activities on the other hand do not contribute to customer-perceived value.

9. State whether each of the following independent activities is value added or non-value added:(May'12)

i. Polishing of furniture used by a systems engineer in a software firm.
ii. Maintenance by a software company of receivables management software for a banking company.
iii. Painting of pencils manufactured by a pencil factory.
iv. Cleaning of customers'computer key boards by a computer repair centre.
v. Providing, brake adjustments in cars received for service by a car service station. (5 marks)

Answer:

i. Non – value added; ii. Value added; iii. Value added; iv. Value added; v. Value added

10. "Cost can be managed only at the point of commitment and not at the point of incidence. Therefore, it is necessary to manage cost drivers to manage cost." Explain the statement with reference to structural and executional cost drivers. (Nov 2007)

Answer:

A firm commits costs at the time of designing the product and deciding the method of production. It also commits cost at the time of deciding the delivery channel (e.g. delivery through dealers or own retail stores). Costs are incurred at the time of actual production and delivery. Therefore, no significant cost reduction can be achieved at the time when the costs are incurred. Therefore, it is said that costs can be managed at the point of commitment. Cost drivers are factors that drive consumption of resources. Therefore, management of cost drivers is essential to manage costs. Structural cost drivers are those which can be managed by effecting structural changes. Examples of structural cost drivers are scale of operation, scope of operation (i.e. degree of vertical integration), complexity, technology and experience or learning. Thus, structural cost drivers arise from the business model adopted by the company. Executional cost drivers can be managed by executive decisions, examples of executional cost drivers are capacity utilization, plant layout efficiency, product configuration and linkages with suppliers and customers. It is obvious that cost drivers can be managed only at the point of structural and operating decisions, which commit resources to various activities.

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Standard Costing

CIMA's terminology defines Standard Costing as follows:

Standard Costing: A control technique which compares standard costs and revenues with actual results to obtain variances which are used to stimulate improved performance. You will see from this definition that there are very close relationships between standard costing and budgetary control (the practice of making continuous comparison between budget and actual results). They both compare the actual results with the expected performance to identify any variances. The difference is that with standard costing the comparison is usually made at a unit level, that is, the actual cost per unit is compared with the standard cost per unit. The resulting variances may be analysed to show their causes and we will see how this is done later in this chapter.

In order to be able to apply standard costing it must be possible to identify a measurable cost unit. This can be a unit of product or service but it must be capable of standardizing: for example, standardized tasks must be involved in its creation. The cost units themselves do not necessarily have to be identical : for example, standard costing can be applied in some job costing situations where every cost unit is unique. However, the jobs must include standardized tasks for which a standard time and cost can be determined for monitoring purposes. In presence of Standard Costing, a budget is multiplication of Standard costing.

1. What is a Standard Cost?
Answer:
A Standard cost is a carefully predetermined unit cost which is prepared for each cost unit. It contains details of the Standard amount and price of each resource that will be utilised in providing the service or manufacturing the product.

2. Standard costing in the modern industrial environment: It is mainly applied in ERP performance measurement.
Answer: There has recently been some criticism of the appropriateness of standard costing in the modern industrial environment. The main criticisms include the following:

i. Standard costing was developed when the business environment was more stable and operating conditions were less prone to change. In the present dynamic environment, such stable conditions cannot be assumed.
ii. Performance to standard used to be judged as satisfactory, but in today's climate constant improvement must be aimed for in order to remain competitive.
iii. The emphasis on labour variances is no longer appropriate with the increasing use of automated production methods.
iv. An organization's decision to use standard costing depends on its effectiveness in helping managers to make the correct decisions.

Standard costing may still be useful even where the final output is not standardized. It may be possible to identify a number of standard components and activities for which standards may be set and used effectively for planning and control purposes. In addition, the use of demanding performance levels in standard costs may help to encourage continuous improvement.

3. What is variance analysis?
Answer: A variance is the difference between the expected standard cost and the actual cost incurred. A unit standard cost contains detail concerning both the usage of resources and the price to be paid for the resources. Variance analysis involves breaking down the total variance to

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explain how much of it is caused by the usage of resources being different from the standard, and how much of it is caused by the price of resources being different for the standard.
These variances can be combined to reconcile the total cost difference revealed by the comparison of the actual and standard cost.

A variance is said to be favourable if it causes actual profit to be greater than budget; it is said to be adverse if it causes actual profit to be less than budget. Variance are use to measure performance of cost. Different responsible managers:

Variance analysis are of 2 types:

1. Variable cost Variance
2. Fixed cost variance

4. Under the single plan, record the journal entries giving appropriate narration, with indication of amounts of debits or credits alongside the entries, for the following transactions using the respective control A/c.

i) Material price variance (on purchase of materials)
ii) Material usage variance (on consumption)
iii) Labour rate variance. (Nov'06)

Answer:

i) Dr. Material Control A/c
Dr. or Cr. Material Price Variance A/c
Cr. Creditors A/c
(Being price variance during purchase of materials)

ii) Dr. WIP Control A/c
Dr. or Cr. Material Usage Variance A/c
Cr. Material Control A/c
(Being recording of usage variance at std. cost of excess/under utilized quantity)

iii) Dr. Labour Control A/c
Dr. or Cr. Labour Rate Variance A/c
Cr. Cash/Bank/Outstanding Wages A/c
(Being rate variance during payment / outstanding of wages)

5. "Overhead variances should be viewed as interdependent rather than independent" (May'06)
Answer: The operations of a firm are so inter linked that the level of performance in one area of operation will affect the performance in other areas. Improvements in one area may lead to improvements in other areas. A sub-standard performance in one area may be compensated by a favourable performance in another area, Because of such interdependency among activities in the firm, the managers should not jump to conclusions merely based on the label of variances namely favourable or unfavourable. They should remember that there is a room for trade off amongst variances. Hence, variances need to be viewed as 'attention directors' rather than problem solvers. Thus, a better picture will be captured when overhead variance are not viewed in isolation but in an integrated manner.

6. What are the basic difference between Standard Costing and Budgetary Control ?
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

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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.

7. 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.

i. 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.

ii. Distributing variances on pro-rata basis over the cost of sales, work-in-progress and finished goods stocks by using suitable basis.

iii. 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.

8. Mention the causes that give rise to Labour rate variance. (Nov'99)
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.

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9. "Calculation of variances in standard costing is not an end in itself, but a means to an end." Discuss. (May 1999)

Answer: The crux of standard costing lies in variance analysis. Standard costing is the technique whereby standard costs are predetermined and subsequently compared with the recorded actual costs. It is a technique of cost ascertainment and cost control. It establishes predetermined estimates of the cost of products and services based on management's standards of efficient operation. It thus lays emphasis on "what the cost should be". These should be costs are when compared with the actual costs. The difference between standard cost and actual cost of actual output is defined as the variance.

The variance in other words in the difference between the actual performance and the standard performance. The calculations of variances are simple. A variance may be favourable or unfavourable. If the actual cost is less than the standard cost, the variance is favourarable but if the actual cost is more than the standard cost, the variance will be unfavourable. They are easily expressible and do not provide detailed analysis to enable management of exercise control over them. It is not enough to know the figures of these variances from month to month. We infact are required to trace their origin and causes of occurrence for taking necessary remedial steps to reduce / eliminate them.

A detailed probe into the variance particularly the controllable variances helps the management to ascertain:

(i) the amount of variance
(ii) the factors or causes of their occurrence
(iii) the responsibility to be laid on executives and departments and
(iv) corrective actions which should be taken to obviate or reduce the variances.

Mere calculation and analysis of variances is of no use. The success of variance analysis depends upon how quickly and effectively the corrective actions can be taken on the analysed variances. In fact variance gives information. The manager needs to act on the information provided for taking corrective action. Information is the means and action taken on it is the end. In other words, the calculation of variances in standard costing is not an end in itself, but a means to an end.

10. Describe three distinct groups of variances that arise in standard costing. (May 2000)

Answer: The three distinct groups of variances that arise in standard costing are:

i. Variances of efficiency: These are the variance, which arise due to efficiency or inefficiency in use of material, labour etc.

ii. Variances of prices and rates: These are the variances, which arise due to changes in procurement price and standard price.

iii. Variances due to volume: These represent the effect of difference between actual activity and standard level of activity. These can be summarized as under:

Element of cost	Variance of Efficiency	Variance of price	Variance of volume
Material	Usage, Mixture, Yield	Price	Revision
Labour	Efficiency, idle time	Rate of pay	--
Variable Overhead	Efficiency	Expenditure	Revision
Fixed Overhead	Efficiency	Expenditure	Revision Capacity Calendar

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11. State the features of Partial plan of Standard Cost Accounting procedure.(May 2001)

Answer:
Features of Partial Plan of Standard Cost Accounting procedure:
Standard cost operations can be recorded in the books of account by using partial plan, Features of partial plan of standard costing procedure are as follows:

i. Partial plan system uses current standards in which the inventory will be valued at current standard cost figure.

ii. Under this method WIP account is charged at the actual cost of production for the month and is credited with the standard cost of the month's production of finished product.

iii. The closing balance of WIP is also shown at standard cost. The balance after making the credit entries represent the variance from standard for the month.

iv. The analysis of variance is done after the end of the month.

12. "Standard costing variances centre around comparison of actual Performance with the standard and the standards or plans are normally based on the environment anticipated when the targets are set and if the current environment is different from that anticipated, such analysis cannot measure managerial performance". Comment on the statement and how will you deal with the situation with reference to material, labour and sales variances. (Nov 2000)
Answer:
The statement give in the question highlights practical difficulties faced by our industries today.

When the current environmental conditions are different from the anticipated environmental conditions (prevailing at the time of setting standard or plans) the use of routine analysis of variance for measuring managerial performance is not desirable / suitable.

The variance analysis can be useful for measuring managerial performance if the variances computed are determined on the basis of revised targets / standards based on current actual environmental conditions. In order to deal with the above situation i.e. to measure managerial performance with reference to material, labour and sales variances, it is necessary to proceed and compute the following variances.

Material variances:
In the case of material purchase price variance, suppose the standard price of raw material determined was Rs.5 per unit, the general market price per unit at the time of purchase was Rs.5.20 and actual price paid per unit was Rs.5.18 on the purchase of say 10,000 units of raw material.

In this case the variances to be computed should be:

Uncontrollable material purchase price planning variance:
= (Standard price p.u. – General market price p.u.) X Actual quantity purchased
= (Rs.5 – Rs.5.20) X 10,000 units = Rs.2,000 (Adverse)

Controllable material purchase price efficiency variance:
= (General market price p.u. – Actual price paid p.u.) X Actual quantity purchased
= (Rs.5.20 – 5.18) X 10,000 units
= Rs.200 (Fav.)

In the case of material usage variance, suppose the standard quantity per unit be 5 kgs, actual production units be 250 and actual quantity of material used is 1,450 kgs. Standard cost of

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material per kg. was Re.1. Because of shortage of skilled labour it was felt necessary to use unskilled labour and that increased material usage by 20%. The variances to be computed to deal with the current environmental conditions will be:

Uncontrollable material usage planning variances:

= (Original std. quantity in kgs. – Revised std. quantity in kgs.) X Standard price per kg.
= (1,250 kgs. – 1,500 kgs) X Re.1
= Rs.250 (Adverse)

Controllable material usage efficiency variance:

= (Revised standard quantity in kgs. Actual quantity used in kgs.) X Std. price per kg.
= (1,500 kgs. – 1,450 kgs.) X Re.1
= Rs.50 (Favourable)

Labour variances:

Like material variances, here also labour efficiency and wage rate variances should also be adjusted to reflect changes in environmental conditions that prevailed during the period. The labour efficiency variances would be equivalent to the following two variances.

(a) Uncontrollable labour efficiency planning variance
(b) Controllable labour efficiency variance

The above variances would arise when unskilled labour is substituted for skilled labour.

Similarly, one uncontrollable and other controllable variance would arise in the case of wage rate variance as well under current environmental conditions.

Sales variances:

The conventional sales volume variance reports the difference between actual and budgeted sales, priced at the budgeted contribution per unit. The variance merely indicates whether sales volume is greater or less than expected. It does not indicate how well sales management actual sales volume should be compared with an expert estimate that reflects the market conditions prevailing during that period.

Total sales margin variance (planning element):

= {Expert's budgeted sales volume X (Expert's selling price – Standard cost) – Original budgeted sales volume X (Budgeted selling price – Standard cost)}

Total sales margin variance (appraisal element):

= {Actual sales volume X (Actual selling price – Standard cost)}
= Expert's budgeted sales volume X (Expert's selling price – Standard cost)}

The figure of "Expert's budgeted sales volume" for a particular product can be determined by estimating the total market sales volume for the period and then multiplying the estimate by the target percentage of market share.

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Marginal Costing & C.V.P. Analysis

It is a pricing technique followed at a time of depression. Here we have to calculate the variable cost of the product for the purpose of its CVP analysis.

So far in this text we have worked within the framework of a total costing system. With absorption costing, all stock items are valued at their full production cost. This includes fixed production overhead which has been absorbed using one of the bases which you learned about earlier.

In contrast, marginal costing values all stock items at their variable or marginal costs only. Fixed costs are treated as period costs and are written off in full against the contribution for the period.

Since the two systems value stocks differently, it follows that each will report a different profit figure for the period if stock levels alter.

The terms marginal costs and variable cost tend to be used interchangeably. In marginal costing the variable costs are matched against the sales value for the period to highlight an important performance measure: Contribution. **Contribution = Sales value- Variable Costs**

It is called contribution because it literally does contribution towards fixed costs and profit. Once the contribution has been calculated for the period, fixed costs are deducted to determine the profit for the period.

1. Mention the important factors to be considered in Marginal Costing Decisions. (Nov'99)
Answer:

i. Whether the product or production makes a contribution.

ii. In the selection of alternatives, additional fixed costs if any should be considered.

iii. The continuity of demand after expansion and its impact on selling price are to be considered.

iv. Non-cost factors such as the need to keep labour force intact and government attitude are also to be taken into account.

2. What is CVP analysis and what purposes does it serve? Explain.
Answer: Profit per unit of a product depends on its selling price and cost of sales. Total profit depends on sales volume which in turn depends interalia on selling price. By and large cost also depends on volume of production. Thus, a close relationship exist between costs, volume and profit. Analysis of this relationship opens up an interesting and useful field for the management accountant. Cost-volume-profit analysis may be applied for profit planning, cost control, and decision making.

The following purposes are served by analysis of cost-volume-profit relationship :

i. to forecast profit fairly accurately.

ii. to set up flexible budgets.

iii. To evaluate performance for control.

iv. To ascertain the effects of costs of changes in volume for market expansion or contraction.

v. To formulate price policies.

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vi. To known the amount of overhead costs that could be charged to productions costs at various levels of operation.

3. What are the assumptions of cost-volume-profit analysis ?
Answer:

- ❖ All variables remain constant per unit.
- ❖ A single product or constant sales mix.
- ❖ Fixed costs do not change.
- ❖ Profits are calculated on variable cost basis.
- ❖ Total costs and total revenues are linear functions of output.
- ❖ The analysis applies to relevant range only.
- ❖ Costs can be accurately divided into fixed and variable components.
- ❖ The analysis applies only to short-term horizon.

4. List out the assumptions of break-even analysis.
Answer. The assumptions underlying break even analysis are as below :

- ❖ All costs can be easily classified into fixed and variable components.
- ❖ Both revenue and cost functions are linear over the range of activity under consideration .
- ❖ Prices of output and input remain unchanged.
- ❖ Productivity of the factors of production will remain the same.
- ❖ The state of technology and the process of production will not change.
- ❖ There will be no significant change in the levels of inventory.
- ❖ The company manufactures a single product.
- ❖ In the case of a multi-product company, the sales mix will remain unchanged.

5. Discuss the main limitations of break-even chart. (May'99)
Answer : The main limitations of break-even chart are as follows :

i. The variable cost line need not necessarily be a straight line because of the possibility of operation of law of increasing costs or law of decreasing returns.

ii. Similarly the selling price will not be a constant factor. Any increase or decrease in output is likely to have an influence on the selling price.

iii. When a number of products are produced, separate break-even charts have to be drawn. This poses a problem of apportionment of fixed expenses to each product.

iv. Break-even charts ignore the capital employed in business which is one of the important guiding factor in the determination of profitability.

v. The preparation of break-even chart presumes that costs can be reliably divided into fixed and variable component. This is very difficult in practice.

vi. The break-even chart presumes that production and sales will be synchronized at all points of time or in other words, the entire production will be sold. This may not be true in practice.

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6. Break even point :

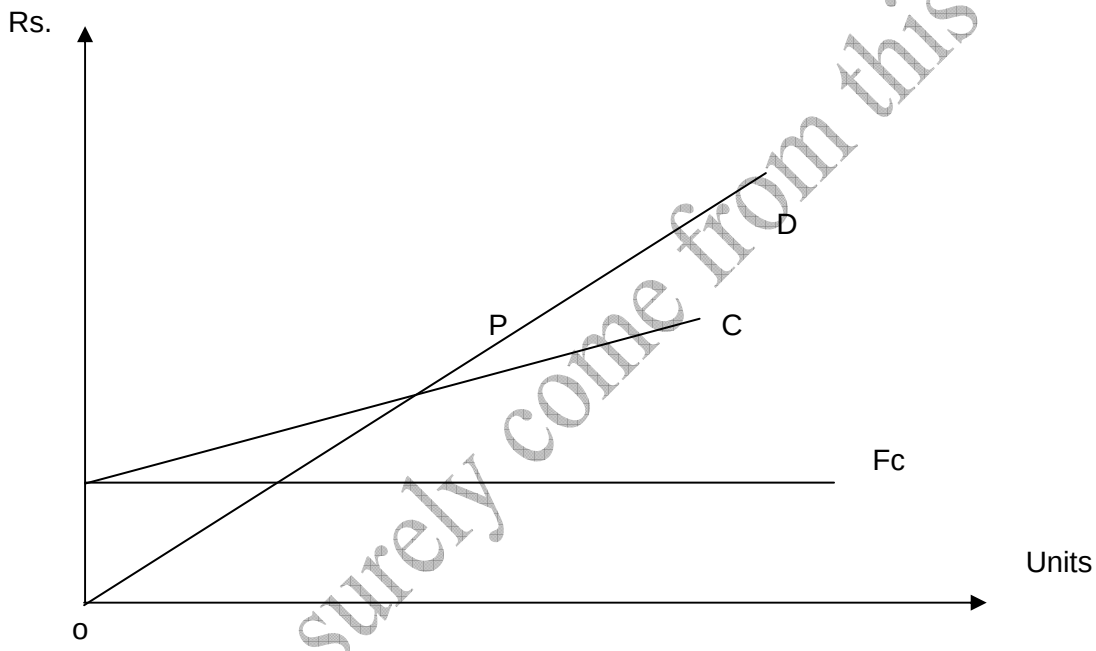
Answer: Breakeven point represents that volume of production where total cost equal total revenue resulting into a no-profit no-loss situation. If output falls below that point, there is loss and if output exceeds the point there is profit. Therefore at break even point.

Revenue = Total Cost

Sales = S = C = Fixed Cost + Variable Cost

Sales-variable Cost = Contribution = Fixed Cost

It can be concluded that at break even point the contribution earned just covers the fixed cost and at levels below the point contribution earned is not adequate to match the fixed cost and at levels above the point contribution earned more than recovers the fixed cost.



P is the break even point in the break even chart where OD and OC being the sales line and cost line interests. Loss result in the left side of i.e. before the break even point is reached and beyond P profit starts to generate.

Break even point has a wide use in the field of marginal costing and helps to decide the production mix, fixation of price, to be taken in long term planning etc.

7. Briefly discuss Curvilinear CVP analysis. (Nov'01)

Answer: In CVP analysis, the usual assumption is that the total sales line and variable cost line will have linear relationship, that is, these lines will be straight lines, However, in actual practice it is unlikely to have a linear relationship for two reasons, namely :

i. After the saturation point of existing demand the sales value may show a downward trend.

ii. The average unit variable cost declines initially, reflecting the fact that, as output increases the firm will be able to obtain bulk discounts on the purchase of raw materials and can also benefit from division of labour. When the plant is operated at further higher levels of output, due to bottlenecks and breakdowns the variable costs per unit will tend to increase. Thus the law of increasing costs may operate and the variable cost per unit may increase after reaching a particular level of output.

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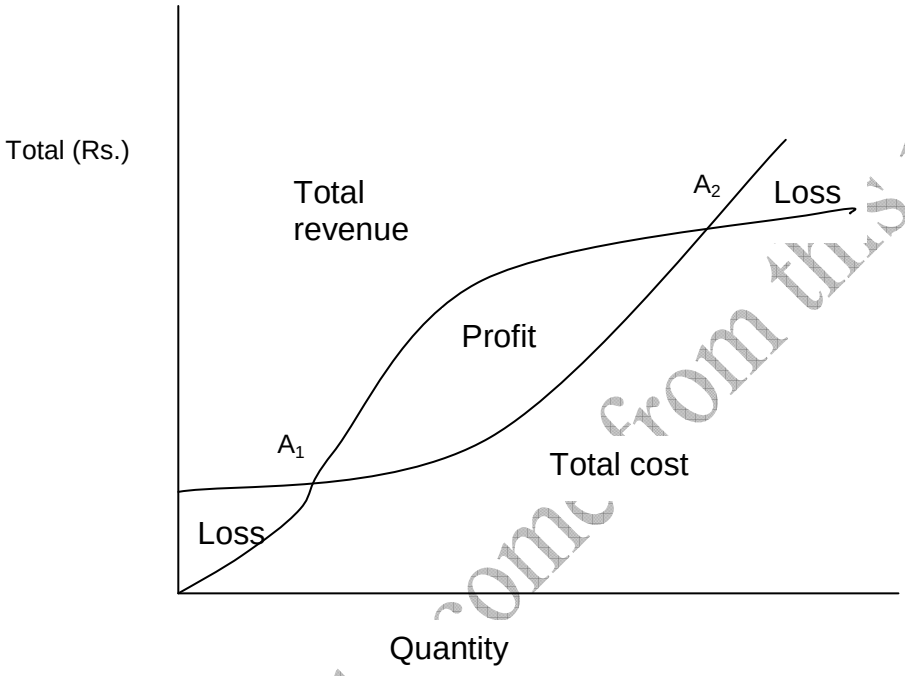
iii. In such cases, the contribution will not increase in linear proportion on the phenomenon of diminishing marginal productivity, the total cost line will not be straight, as assumed but will be of curvilinear shape. This situation will give rise to two break even points. The optimum profit profits is earned at the point where the distance between sales and total cost is the greatest.

In the diagram A1 and A2 are the two break-even point



8. Margin of Safety. How margin of safety can be improved. (Nov'09, May'99)

Answer: Margin of safety is the difference between the sales or production at a particular level of activity and the break even sales a production. A large margin of safety indicates the soundness of the business and correspondingly a small margin of business indicates a not too-sound position. Margin of safety can be improved by lowering the fixed cost and variable costs, increasing the volumes of sales and production, increasing the selling prices or changing the product mix resulting into a better overall Profit/Volume ratio. **Margin of safety = Profit ÷ P/V ratio.**

Margin of safety is also immensely useful for making inter-firm comparison. This is being done by calculating their margin of safety ratio. This ratio can be calculated by suing the following formula:

Margin of safety ratio = Sales ÷ Margin of Safety × 100

= (Actual sales - Break even sales) ÷ Sales × 100

Steps to increase margin of safety :

i. Increase in Selling Price; provided the demand is inelastic so as to absorb the increased prices.

ii. Increase in Sales Volume: by increasing sales volume provided capacity is available.

iii. Change in Product Mix: By the substitution or introduction of a product mix such that more profitable lines are introduced. Consequently, the contribution will increase and it will increase the margin of safety.

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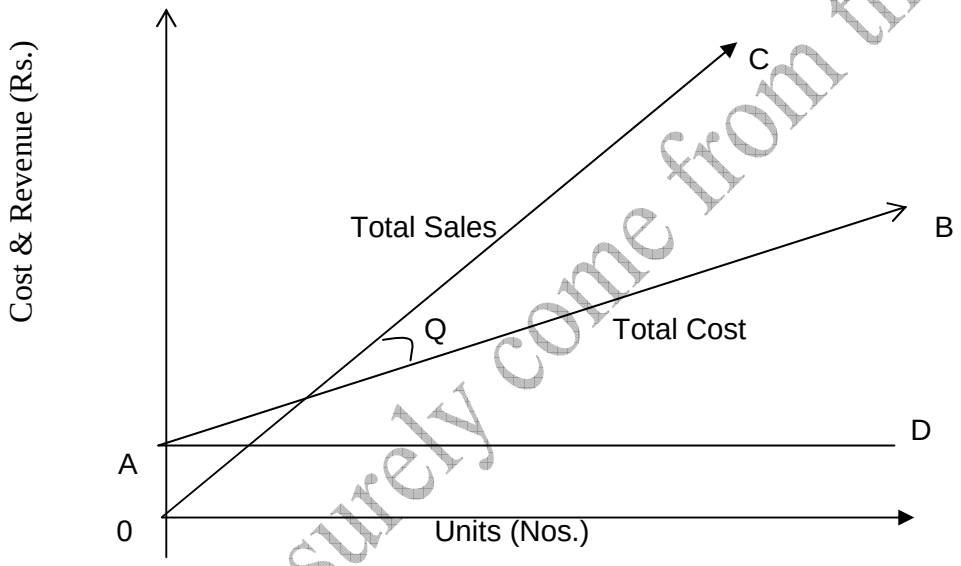
iv. Reduction in fixed expenses: The reduction in fixed expenses will reduce the break even sales. As a result, margin of safety will improve.

v. Reduction in variable cost: The reduction in variable cost will increase the contribution. As a result, the margin of safety will improve.

9. Angle of Incidence (May'08) :

Answer: It is the angle of intersection between the sales and the total cost lines. It indicates the profit earning capacity of the concern at a certain level of sales production. The larger the angle of incidence the more is the profit earning capacity and vice versa. It also provides an indication as to what extent the output & sales price may be varied to attain a desire level of profit. It gives an easy and clear idea to the profitability under different levels of activities & also for different product mix & is a simple visual aid to find out profit earning capacity without going in for any calculation.



Angle of incidence (0) is the angle between the total cost line and the total sales line. If the angle is large, the firm is said to make profits at a high rate and vice-versa.

A high angle of incidence and a high margin of safety indicate sound business conditions.

10. Indicate any five circumstances under which you will permit to fix a price, which is less than the marginal cost of the product.

Answer: Circumstances under which a firm may fix a price less than the marginal cost of the product are as under :

i. When goods are of perishable nature.

ii. When the concern had already purchased huge quantities of raw materials and the prices of these materials is falling considerably in the market.

iii. When competitors are to be eliminated from the market.

iv. When a new product is to be introduced in the market.

v. To obviate shut-down costs.

vi. To push-up the sale of another highly profitable product.

vii. To capture future market.

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11. Write notes on Key Factor

Answer: Every business aims to produce and sell unlimited units of the product manufactured by it. But it is not possible due to non-availability of some production factor. Such a factor is known as the key factor or Limiting factor or Short supply resource. In most of the cases 'sales' is the key factor. It determines the volume of output to be produced.

Sometime sales may not be the key factor but some other factor such as labour; machine capacity; material; finance etc. which may not be available in requisite quantity & will be a key factor. In other words, key factor is a factor that limits the quantum of activity of a firm at a particular time or over a period of time.

Key factor governs the decision " how much to produce ".

In case, sales being the key factor, the profitability of the product is measured by computing its profit volume ratio.

When any other factor is the key-factor, the most profitable product will be that which would yield maximum contribution per unit of key factor. The profitability of any key-factor other than sales can be ascertained by using the following formula :-

Profitability (per unit) of key factor = Contribution ÷ Key factor

12. Distinguish between absorption costing and marginal costing.

Answer: Main points of distinction between Absorption Costing and Marginal Costing are as follows :

	Absorption Costing	**Marginal Costing**
1.	It is a total cost technique i.e. both variable and fixed costs are charged to products, processes or operations.	Here only variable costs are charged to product, processes or operations. Fixed costs are charged as period costs to the profit statement of the same period in which they are incurred.
2.	Fixed factory overheads are absorbed by the production units on the basis of a predetermined fixed factory overhead recovery rate based on normal capacity. Under/over absorbed overheads are adjusted before arriving at the figure of profit for a particular period.	The cost of production under this method does not include fixed factory overheads and therefore, the value of closing stock comprises of only variable costs. No part of the fixed expenses in included in the value of closing stock and carried over to the next period.
3.	Inspite of best possible forecast and equitable basis of apportionment/allocation of fixed costs, under or over recovery of fixed overheads generally arises.	Since fixed overheads are not included in the cost of production, therefore the question of their under/over recovery does not arise.
4.	Managerial decisions under this costing technique are based on profit i.e. excess of sales value over total costs, which may at times lead to erroneous decisions.	Here decisions are made on the basis of contribution i.e. excess of sales price over variable costs. This basis of decision making results in optimum profitability.

13. "The use of the Absorption costing method in management decision making process leads to anomalies". — Discuss.

Answer: Absorption Costing has been defined by the Institute of Cost and Management Accounts, London as "The practice of charging all costs, both variable and fixed, to operation, processes or products". The ordinary system of costing in which all overheads are apportioned are apportioned over various units of cost, without making a distinction between fixed and variable expenses, is absorption costing. The means that the value of inventory is based on all

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costs, fixed as well as variable. But fixed costs are period costs and hence have no direct relation with output. Any basis on which these costs are allocated or apportioned to production departments or absorbed by output are generally arbitrary. As such it leads to anomalous situations and the allocation of fixed costs to products vitiates the correctness of units cost. It is quite misleading in management of decision, particularly when a product is to be dropped or make or buy decision is to be taken. In such cases, a decision based on total cost will not be correct. In absorption costing, profit becomes a function of production instead of sales. It is thus obvious that use of the absorption costing method in management decision making process leads to anomalies.

14. Profit graph

Answer: Profit graph is a special type of break – even chart which shows the profit or less at different levels of output.

In the following example:

OA = Total fixed expenses C = Break even point

The profit or loss can be calculated by using following when sales are at zero, the total loss is equal to fixed expenses which is equal to OF. The loss demises as the output reaches C, the break – even point and the firm starts earning profits as the output increases beyond the break – even point. The total profit at output level of is equal to B.

When more than one product is manufactured, the Profit graph can be so drawn as to show the cumulative effects of the profit and losses.

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To draw the above diagram , following steps are required --

Step-1: Compute P/V ratio for each product & give rank.

Step-2: Calculate cumulative sales & cumulative profit on the basis of the above ranking.

Step-3: Identify the points on the basis of cumulative sales (x) & cumulative profit (y). Join the points with same line and identify the specific BES.

Step-4: Join the start & end point with a single straight line to find arrange Break even sales

15. Profit/Volume Ratio :

Answer: Profit volume ratio is the ratio of contribution denoting the difference between sales and variable cost. Since in the short term fixed cost does not change, Profit/volume ratio also measures the rate of change of profit due to change in the volume of sales.

Thus Profit/Volume ratio is expressed as Profit/Volume = $\frac{C}{S} = \frac{S-V}{S}$

It is influenced by sales and variable or marginal cost. If the sales price increases without corresponding increase in marginal cost the contribution increases and the Profit volume ratio improves. Similarly if the marginal cost is reduced with sale price remaining same Profit/Volume ratio improves.

The advantage of profit/volume ratio are that it can be used to measure profitability of each product or group of them separately so that the necessity for continuance of such production can be examined. It may also be used to measure the profitability or each production centre, process or operation.

One fundamental property of Profit/Volume ratio is that it remains same at various levels of operation and thus break even points, required selling prices to maintain profits at various levels etc. can be easily calculated by suitable application of this ratio.

16. Discuss the relationship between Angle of Incidence, break-even Level and Margin of Safety. (Nov'99)

Answer:

Angle of Incidence : It is the angle between total sales line and total cost line drawn in the case of break-even chart. It provides useful information about the rate at which profits are being made. The large the angle, the higher the rate of profit or vice-versa.

Break-even level : It is that level of sales (or production) at which the sales revenue exactly equals total costs, both variable and fixed. In other words, it is level of activity at which the firm neither earns a profit nor suffers a loss.

Margin of safety : It is the difference between total sales at break-even point. In other words margin of safety is the amount of sales above the break-even point. If there is a fall in the sales to the extent of margin of safety, the firm will not be in the red.

Relationship between Angle of Incidence, Break-even Level and Margin of Safety -

i. If the break-even point is low and angle of incidence is large. The margin of safety is large and the business enjoys financial stability. A low break-even point indicates that the

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business could be run profitably even if there is a fall in sales, unless the sales are very low.

ii. If the break-even point is low and angle of incidence is small, the conclusions are the same as in 1 above except that the rate of profit earning capacity is not so high as in 1.

iii. If the break-even point is high and angle of incidence is small. The margin of safety is low. The business is very vulnerable, even a small reduction in activity may result in a loss.

iv. If the break-even point is high and angle of incidence is large. This shows that the margin of safety is low. The business is likely to incur losses through a small reduction in activity. However, after the break-even point, the business makes the profit at a high rate.

17. Enumerate the limitations of using the marginal costing technique. (May 2001)
Answer: Marginal costing is defined as the ascertainment of marginal cost and of the effect on profit of changes in volume or type of output by differentiating between fixed costs and variable costs.

Limitations of Marginal Costing Techniques:

i. The limitations of using the marginal costing technique are as follows:

ii. It is difficult to classify exactly the expenses into fixed and variable category. Most of the expenses are neither totally variable nor wholly fixed.

iii. Contribution itself is not a guide unless it is linked with the key factor.

iv. Sales staff may mistake marginal cost for total cost and sell at a price; which will result in loss or low profits. Hence, sales staff should be cautioned while giving marginal cost.

v. Overheads of fixed nature cannot altogether be excluded particularly in large contracts, while valuing the work-in-progress. In order to show the correct position fixed overheads have to be included in work-in-progress.

vi. Some of the assumptions regarding the behaviour of various costs are not necessarily true in a realistic situation. For example, the assumption that fixed cost will remain static throughout is not correct.

18. Distinction between Cost indifference point and Break-even point :
Answer:
Cost indifference point : It is the point at which total cost lines under the two alternatives intersect each other.

Cost indifference point is calculated as under :

Difference in fixed costs ÷ saving in variable cost.

Break-even point : It is the point where the total cost line and total revenue line for a particular alternative intersect each other.

Break-even point calculated as under :

Fixed costs ÷ Contribution per unit or the Fixed costs ÷ PV ratio.

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The following are the main point of distinction between cost indifference point and break-even point.

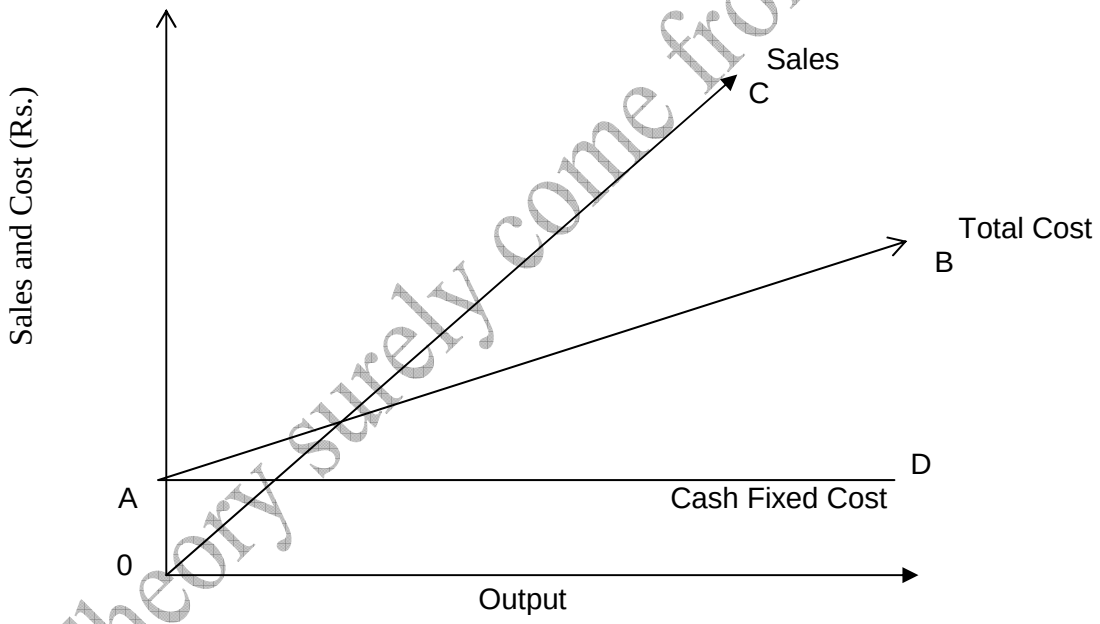
i. The cost indifference point is the activity level at which total cost under two alternatives are equal. Whereas break-even point is the activity level at which the total revenue form a product mix is equal to its cost.

ii. Cost indifference point is used to choose between two alternative processes for achieving the same objective. The choice depends on the estimated activity level. Break even point is used for profit planning.

19. Explain and illustrate cash break-even chart.

Answer: In cash break-even chart, only cash fixed costs are considered. Non-cash items like depreciation etc. are excluded from the fixed cost for computation of break-even point. It depicts the level of output or sales at which the sales revenue will equal to total cash outflow. It is computed as under:

$$\text{Cash BEP (Units)} = \frac{\text{Cash Fixed Cost}}{\text{Contribution p.u.}}$$



Hence for example suppose insurance has been paid on 1st January, 2006 till 31st December, 2010 then this fixed cost will not be considered as a cash fixed cost for the period 1st January, 2008 to 31st December, 2009.

20. What are the methods of segregating Semi-Variable costs into Fixed and Variable costs? (May'00)

Answer: Semi-variable costs as the name suggests are partly fixed and partly variable. The following methods can be applied for segregation of Semi-Variable costs into Fixed and Variable portion –

i. Graphical Method
ii. High and Low Points Method
iii. Analytical Method
iv. Comparision by Period or Level of Activity Method
v. Least Squares Method

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(i) Graphical method: Under this method, a large number of observations regarding the total costs at different levels of output are plotted on a graph with the output on the X-axis and the total cost on the Y-axis. Then, the by judgment, a line of "best fit", which passes through all or most of the points is drawn. The point at which this line cuts the Y-axis indicates the total fixed cost component in the total cost. If a line is drawn at this point parallel to the X-axis, this indicates the fixed cost. The variable cost at any level of output, is derived by deducting this fixed cost element from the total cost.

(ii) High points and low points method: Under this method, the difference between the total cost at highest and lowest volume is divided by the difference between the sales value at the highest and lowest volume. The quotient thus obtained gives the rate of variable cost in relation to sales value. The fixed cost is the remainder; i.e., total cost minus variable cost.

(iii) Comparison by period or level of activity method: Under this method, the variable cost per unit may be determined by comparing two levels of output with the amount of expenses at those levels. Since the fixed element does not change, therefore the variable elements of cost may be ascertained with the help of the following formula:
Change in the amount of expenses
Change in the quantity of output

(iv) Least squared method: This is the best method of separating semi-variable costs into their fixed and variable elements. It is a statistical method and is based on finding out a line of best fit for a number of observations. The method uses the lower equation $y = mx + c$; where m represents the variable element of cost per unit, V represents the total fixed cost, 'y' represents the total cost, V represents the volume of output. The total cost is thus split into fixed and variable elements by solving this equation.

(v) Analytical method: An attempt is made under this method to judge empirically the proportion of semi-variable cost and fixed cost. The degree of variability is determined for each item of semi-variable cost. Once this has been done, the method is easy to apply.

25 Marks Theory surely come from this material

Service Sector

1. Explain the main characteristics of Service sector costing. (5 Marks) (June 09)
Answer: Main characteristics of service sector are as below:

i. **Activities are labour intensive:** The activities of service sector generally are labour intensive. The direct material cost is either small or non-existent.

ii. **Cost-unit is usually difficult to define:** The selection of cost units usually, for service sector is difficult to ascertain as compared to the selection of cost unit for manufacturing sector. The following table provides some examples of the cost units for service sector.

Hospital	– Patient per day, Room per day
Accounting firm	– Charged out client hours
Transport	– passenger km., quintal km.
Machine maintenance	– Maintenance hours provided to user department
Computer department	– Computer time provided to user department.

iii. **Product costs in service sector:** Costs are classified as product or period costs in manufacturing sector for various reasons.

2. How will you apply customer costing in service sector? Explain with the help of a suitable example. (May'06, Nov'10)
Answer: Customer costing analyses the costs incurred to earn the revenues from customers. A customer cost hierarchy, categorizing the costs relating to the customers into different cost pools on the basis of different types of cost drivers or different degrees of difficulty in determining cause and effect relationship, is used. The details of activities involved in customer costing, for example, are sales order processing, sales visits, normal delivery costs, special orders, and credit collection charges. The Central theme of this approach is customer satisfaction. The profitability of different customers or groups of customer will differ.

Customer costing can be introduced in a company engaged in courier service where the costs to serve the customers vary with the type of service selected by customers (how fast the package is to be delivered), the destination, weight, size of package and whether the package is to be collected from customers' location or will be dropped at the office of the courier firm. The firm could use an efficient system of internet strategy to accomplish the tasks like preparing labels at the customers' site, arranging of pick up, dropping at the destination and tracking and tracing packages. The system calculates the freight charges, invoices customers daily and produces customized reports. These parameters can be used with the objective of determining customer profitability and based on the costs involved in handling each customer, the firm can even offer volume discounts to customers who use the services heavily.

3. Write short note on pricing by Service Sector. (Nov'05)
Answer: The service has no physical existence and it must be priced and billed to customers. Most service organizations use a form of time and material pricing to arrive at the price of a service. Service companies such as appliance repair shops, automobile repair business arrives at prices by using two computations, one for labour and other for material and parts. If material and parts are not part of service being performed, the only direct labour costs are used as basis for determining price. For professionals such as accountants and consultants a factor representing all overhead costs is applied to the base labour costs to establish a price for the service, which are generally worked out on the basis of rate per man hour.

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4. Give an appropriate cost unit for each of the following service sectors:

(i) Hotel
(ii) School
(iii) Hospital
(iv) Accounting firm
(v) Transport
(vi) Staff Canteen
(vii) Machine maintenance
(viii) Computer Department
(ix) Power **(June'09, May'12)**

Answer:

	Service Sector	**Cost Unit**
(i)	Hotel	Bed-nights available or occupied, Per room day / or per meal
(ii)	School	Student hours or no. of full time students
(iii)	Hospital	Patient-day / Room-day
(iv)	Accounting firm	Client hours
(v)	Transport	Passenger-Kms, or Quintal km or tonne-km
(vi)	Staff	Canteen No. of meals provided or no. of staff
(vii)	Machine maintenance	Maintenance hours to user departments
(viii)	Computer Department	Computer time to user departments.
(ix)	Power	Per Kilo – watt (kw) hour

5. Discuss with examples, the basic costing methods to assign costs to services. (May 2007)
Answer:

i. **Job costing method:** The cost of a particular service is obtained by assigning costs to a distinct identifiable service. e.g. Job Costing method is used in service sectors – like Accounting Firm, Advertisement campaign.

ii. **Process Costing method:** Cost of a service is obtained by assigning costs to masses of similar unit and then computing cost / unit on an average basis. e.g. Retail banking, postal delivery, credit card etc.

iii. Hybrid method: Combination of both (i) & (ii) above.

6. Write short notes on Operation Costing.
Answer:
Operation Costing : It is defined as the refinement of process costing. It is concerned with the determination of the cost of each operation rather than the process. In those industries where a process consists of distinct operations, the method of costing applied or used is called operation costing. Operating costing offers better scope for control. It facilitates the computation of unit operation cost at the end of each operation by dividing the total operation cost by total output units. It is the category of the basic costing method, applicable, where standardised goods or services result from a sequence of repetitive and more or less continuous operations, or process to which costs are charged before being average over the units produced during the period. The two costing methods included under this head are process costing and service costing.

7. "The more kilometers you travel with your own vehicle, the cheaper it becomes". Comment briefly on this statement.
Answer: The cost per kilometre, (if one travels in his own vehicle) will decline when he travels more kilometers. This is because the majority of costs for running and maintaining vehicles are of fixed and the component of fixed cost per kilometre goes on decreasing with an increase in kilometre travel. Hence, the given statement is true.

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8. "Operation costing is defined as refinement of Process costing." Explain it
Answer:
Operation costing is concerned with the determination of the cost of each operation rather than the process:

i. In the industries where process consist of distinct operations, the operation costing method is applied.

ii. It offers better control and facilitates, the computation of unit operation cost at the end of each operation.

9. Explain The instantaneous & perishable nature of services.
Answer:
Many services are provided instantaneously rather than for inventory (stock); for example, a restaurant meal is cooked as it is ordered by the customer. This brings with it particular management problems of planning and control but it does mean that the incidence of WIP is very low, that is, it is rarely necessary to value part-finished units of service at the end of an accounting period.

Many services also 'perish' immediately; for example, if a cinema seat is vacant when a film is showing it cannot be stored in inventory (stock) for a later sale. The opportunity to gain revenue from that seat at that particular showing of the film has been lost forever. Therefore, capacity utilization becomes a very important issue for managers in many service organisation.

10. What factors are considered for Pricing by service sector?
Answer:
The service provided by service sector has no physical existence, a value is to be fixed and billed for its clients. Most of the service organizations use a form consisting of time and material pricing to arrive at the price of a service.
Service companies such as appliance repair shops, automobile repair business, calculate their prices by using two computations, one for labour and other for materials and parts. A mark-up percentage may also be added to the cost of labour, materials and parts to arrive at the price to be billed. For professionals, direct labour costs and apportioned overhead and indirect costs are considered for pricing.

11. What are the Problems for adoption of ABC system in service organization?
Answer:
(i) Facility sustaining costs (such as property, rents etc.) represent a significant portion of total costs and may only be avoidable if the organization ceases business. It may be impossible to establish appropriate cost drivers.
(ii) It is often difficult to define products where they are of intangible nature. Cost objects can therefore be difficult to specify.
(iii) Many service organizations have not previously had a costing system and much of the information required to set up a ABC system will be non-existent. Therefore introduction of ABC may be expensive.

12. What are the methods of costing used in service sector?
Answer:
1. **Cost Accumulation:** To draw a cost sheet under operating costing, cost are usually accumulated for a specified period viz. a month, quarter of year etc.

2. **Cost Classification:** The costs so accumulated are classified under the following three heads

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(a) Fixed costs or standing charges
(b) Variable costs or running charges
(c) Semi-variable costs or maintenance costs

If information about interest cost is specifically given, it is treated as a fixed cost.

3. **Cost Expression:** The total cost so collected is divided by the Denominator Factor/Cost unit, applicable for the particular service, to determine the cost per unit of service rendered.

4. **Costing Methods:** To secure better understanding of costs, and as an aid to decision-making and cost control, service sector costs can be ascertained on any of the following methods

   (a) Job Costing Methods: Here, the cost of a particular service is obtained by assigning cost to a distinct identifiable service. This is used in services like accounting firms, advertising campaigns, etc.

   (b) Process Costing Method: Here, the cost of a service is obtained by assigning costs to a lot (batch) of homogenous units and then computing unit cost on an average basis e.g. Retail banking, postal delivery, credit card etc.

   (c) Hybrid Costing Method: This method combines elements of both job costing and process costing methods.

   (d) Activity Based Costing Method: This method recognizes the fact that all costs are overhead and therefore related to the Activities and Cost Drivers that govern them.

Therefore related to the Activities and Cost Drivers that govern them.

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Decision Making: Marginal, IRDC & DCF Approach

1. Explain the concept of relevancy of cost by citing three examples each of relevant costs and non- relevant costs. (Nov'08)

Answer: Relevant costs are those costs which are affected by a decision. Relevance means pertinent to the decision in hand. The expected future costs which are essential and which differ by taking an alternative course of action are relevant costs.

Examples of relevant costs are :

- Past costs are not relevant costs. (i.e. Sunk cost)
- Historical costs or sunk costs are not relevant.
- Variable costs are relevant costs.
- Fixed costs are not relevant. Unless discretionary
- Book value of an equipment is not relevant.
- Disposal value of an equipment is relevant.
- Fixed costs which differ by decision becomes relevant.

Examples of non-relevant costs:

- All fixed costs are generally non-relevant.
- Variable costs which do not vary with the decision are not relevant costs.
- Book value of the asset is not relevant.

2. Indicate the major areas of short-term decisions in which differential cost analysis is useful. (May'08)

Answer: Cost information is required both for short-term and long-run managerial problems. Differential costs are of particular use in short-term problems, which are non-repetitive, one time, ad-hoc problems. When two levels of activities are being considered, or while choosing between competing alternatives differential cost analysis is essential The following are the most common short-term problems and areas where differential cost analysis may be deployed.

1. Accept – or –reject special may be deployed.
2. Make – or – buy decisions.
3. Sell – or –process decisions.
4. Reduce – or – maintain price decisions.
5. Add – or – drop production decisions.
6. Operate -- or – shut down decisions.
7. Capital expenditure decisions
8. Sales mix decision
9. Change in level or nature of an activity
10. Production or product decision

3. What are incremental costs, Incremental Revenue and sunk cost? Discuss

Answer:

Incremental costs: The difference in total cost between two alternatives or production level is an incremental cost. It is synonymous to differential cost. Incremental cost arise due to change of the level of activity. The change may be due to adding of a new product; change of channels of distribution, adding capacity etc. Incremental costs are not necessary variable in nature.

Incremental revenue: is the additional revenue that arises from the production or sale of a group of additional units. It is one of the two basis concepts the other being incremental cost which go together with differential cost analysis. Incremental cost in fact is the added cost due to change either in the level of activity or in the nature of activity.

Sunk Cost: Cost which do not change under given circumstances and do not play may role in decision making process are known as sunk costs. They are historical costs incurred in the past. In other worlds, these are the costs which have been incurred by a decision made in past and cannot

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be changed by any decision made in the future. These costs are, however, best basis of predicting future cots. Amortisation of past expenses is the clearest kind of sunk cost.

4. Marginal Costing vs. Differential Cost Analysis
Answer:
Similarities

i. Both are techniques of cost analysis and presentation and are used for formulating policies and for taking management decisions.

ii. When fixed costs remain same, both marginal costs and differential costs are the same. if variable cost per unit is constant

Dissimilarities

i. Differential costs apply to a fixed additional quantity of production while marginal costs apply to any additional unit.

ii. The method of cost presentation may not be same under the two. For instance, marginal costs are ascertained on the basis of 'contribution approach' while differential costs may be ascertained under both absorption and marginal costing techniques

iii. Under marginal costing, product costs do not include fixed costs while differential costs may include fixed costs which are common or traceable if the additional volume involves additional fixed cost outlay

iv. Unlike marginal costing, differential cost analysis statements do not find their place in accounting records.

v. In marginal costing, unit contribution, p/v ratio, contribution per unit of limiting factor etc. are taken as yardsticks for evaluation of performance and marginal decisions. On the other hand, in differential cost analysis, differential costs are compared with incremental revenues for many policy decisions.

5. "Sunk Cost is irrelevant in decision-making, but irrelevant costs are not sunk costs". Explain with example. (May'06, Nov'09, May'01)
Answer: Sunk costs are costs that have been created by a decision made in the past and that cannot be changed by any decision that will be made in the future. For example, the written down value of assets previously purchased are Sunk costs. Sunk costs are not relevant for decision making because they are past costs.

But not all irrelevant costs are sunk costs. For example, a comparison of two alternative production methods may result in identical direct material costs for both the alternatives. In this case, the direct material cost will remain the same whichever alternative is chosen. In this situation, though direct material cost is the future cost to be incurred in accordance with the production, it is irrelevant, but, it is not a sunk cost.

6. Explain briefly the concepts of Opportunity costs and Relevant costs. (June'09)
Answer:
Opportunity cost is a measure of the benefit of opportunity forgone when various alternatives are considered.

It is the cost of sacrifice made by alternative action chosen.

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E.g. opportunity cost of funds invested in business is the interest that could have been earned by investing the funds in bank deposit.

Relevant Cost:
Expected future costs which differ for alternative course.

(Or)

It is not essential that all variable costs are relevant and all fixed costs are irrelevant. Fixed, or variable costs that differ for various alternatives are relevant costs. Relevant costs draw our alternation to those elements of cost which are relevant for the decision.

E.g. Direct labour under alternative I – Rs.10/ hour
Direct labour under alternative II – Rs.20/hour
Then, direct labour is relevant cost.

7. "Relevant cost analysis helps in drawing the attention of managers to these elements of cost which are relevant for the decision." Comment.
Answer: Relevant costs are pertinent or valid costs for a decision. These bear upon or ' influence decision' and are directly related to the decisions to be made. These are critical to the decision, and have significance for it. These are the cost which generally respond to managerial decision making, and have significance in arriving at correct conclusions. These costs are capable of making a difference in user-decisions and enter into a choice between alternative courses of action. In specific terms, relevant costs for decisions are defined as 'expected future costs that will differ under alternatives".

Relevant costs are futuristic in nature. These are the costs that are expected to occur during the time period covered by the decision.

8. Briefly explain the concept of 'Opportunity Cost'.
Answer: It may be defined as prospective change in cost following the adoption of an alternative machine, process, raw materials, specification or operation. In other words, it is the cost of opportunity lost by the diversion of an input factor from one use to another.

It is measure of the benefit of opportunity foregone. The opportunity cost of the value of opportunity foregone is taken into consideration when alternatives are compared.

The introduction of opportunity cost concept is helpful to the management in making profitability calculations when one or more of the inputs required by one or more of the alternative courses of action is already available. These inputs may nevertheless have a cost and this is measured by the sacrifice made by the alternative action chosen or the cost that is given up in order to make them available for the current proposal.

9. Briefly explain the implications of replacement costs and historical costs in financial reporting.
Answer : Replacement costs and historical costs are two alternative methods of showing assets in financial reporting.

Historical cost is the actual cost of an asset at the time of its acquisition. Replacement cost is the cost to be incurred on an asset if it is replaced. These two cost concepts, on which valuation of assets is based for financial reporting purposes, differs because of price variations over a period of time. In case the price of an asset remains the same with the passage of time then historical cost coincides with replacement cost.

Under financial reporting viz. In the balance sheet assets are recorded at their historical cost. When prices rise substantially over a period of time, historical cost do not properly indicate the

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actual costs. For managerial decisions, therefore these costs should properly be adjusted for price changes. The distinction between historical costs and replacement cost is thus relevant when past experience has to be considered as a guide to future costs for a proposed course of action .

10. What is cost analysis ? How it is useful in decision making ?
Answer: Cost analysis is the break up or classification of the aggregate costs into relevant types. Such an analysis of cost is an essential pre-requisite of controlling costs and for decision making.

Identifiability of cost (i.e. direct cost) with units of products or operations is one such basis of cost classification. The importance of distinguishing costs as direct or indirect lies in the fact that direct costs of a product or an activity can be accurately allocated while indirect costs have to be apportioned on the basis of certain assumptions. Thus it is helpful for management if costs are classified on the basis of their identifiability with the units of products, processes or work orders. This is so because direct costs are controllable at the operational level whereas indirect costs are not amenable to such control.

For the purpose of **decision making** and control, costs are distinguished on the basis of their relevance to the different types of decisions and control functions. Thus, expenditure which has taken place, is irrelevant in a situation & sunk cost. Cost incurred as a result of past decisions which cannot be altered by another decision at a subsequent date is known as sunk cost. Thus, for decisions with future implications, a sunk cost is an irrelevant cost. If a decision has to be made whether to replace the existing plant, the book value of the existing plant is to be regarded as a sunk cost as it is irrelevant to the question of its replacement. The decisive factor would be the difference in income which will result from the installation of a new plant, and the expected rate of return on the new investment.

Costs which are relevant are only to be taken into account and all such costs are analysed accordingly. Present and future cash expenditure connected with a decision are the result of proper cost analysis.

11. What are the applications of incremental cost techniques in making managerial decisions? (May'00, May'10)
Answer:
Incremental cost technique: It is a technique used in the preparation of ad-hoc information in which only cost and income differences between alternative courses of action are taken into consideration. This technique is applicable to situations where fixed costs alter.
The essential pre-requisite for making managerial decisions by using incremental cost technique, is to compare the incremental costs with incremental revenues. So long as the incremental revenue is greater than incremental costs, the decision should be in favour of the proposal.

Applications of incremental cost techniques in making managerial decisions
The important areas in which incremental cost analysis could be used for managerial decision making are as under :

i. Introduction of a new product
ii. Discontinuing a product, suspending or closing down a segment of the business
iii. Whether to process a product further or not
iv. Acceptance of an additional order form a special customer at lower than existing price
v. Opening of new sales territory and branch.
vi. Optimizing investment plan out of multiple alternatives.
vii. Make or buy decisions
viii. Submitting tenders
ix. Lease or buy decisions

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12. Comment on the use of opportunity cost for the purpose of :
(i) decision-making and (ii) cost control (May 2001)
Answer:
(i) Decision making: Opportunity costs apply to the use of scarce resources, where resources are not secure, there is no sacrifice from the use of these resources.

Where a course of action requires the use of scarce resources, it is necessary to incorporate the lost profit which will be foregone from using scarce resources.

If resources have no alternative use only the additional cash flow resulting from the course of action should be included in decision making as relevant cost.

(ii) Cost control: The conventional variance analysis will report an adverse usage variance and adverse sales volume variance. However, the failure to achieve the budgeted optimum level of output may be due to inefficient usage of scarce resources. The foregone contribution should therefore be charged to the manger responsible for controlling the usage of scarce resources and not to the sales manager because the failure to achieve the budgeted sales is due to the failure to use scarce resources efficiently.

Thus if resources are scarce, the usage variance should reflect the acquisition cost plus budgeted contribution per unit of the scarce resources.

If the lost sales is made good in subsequent periods, the real opportunity cost will consists of lost interest arising from delay in receiving the net cash-flows and not the foregone contribution.

13. "Cost is not the only criterion for deciding in favour of shut down" – Briefly explain. (May 2000)
Answer:
Cost is not only criterion for deciding in the favour of shut down. Non-cost factors worthy of consideration in this regard are as follows:

i. Interest of workers, if the workers are discharged, it may become difficult to get skilled workers later, on reopening of the factory. Also shut-down may create problems,

ii. In the face of competition it may difficult to re-establish the market for the product.

iii. Plant may become obsolete or depreciate at a faster rate or get rusted. Thus, heavy capital expenditure may have to be incurred on re-opening.

14. State the non-cost factors to be considered in make/buy decisions. (May 2001)
Answer:
Non-cast factors in make / buy decisions:

i. Possible use of released production capacity and facility as a result of buying instead of making.

ii. Sources of supply should be reliable and they are capable of meeting un-interruptedly the requirement of the concern.

iii. Assurance about the quality of goods supplied by outside supplier.

iv. Reasonable certainty, from the side of supplier about, meeting the delivery dates.

v. The decision of buying the product / component from outside suppliers should be discouraged, if the technical know how used is highly secretive.

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vi. The decision of manufacturing product / component should not adversely affect the concern's relationship with suppliers.

vii. Ensure that more than one supplier of product/component is available to reduce the risk of outside buying.

15. Enumerate the factors involved in decisions relating to expansion of capacity. (May 2001)
Answer:
The factors involved in decisions relating to expansion of capacity are enumerated as below:

(i) Additional fixed overheads involved should be considered.
(ii) Possible decrease in selling price due to increased production capacity.
(iii) Whether the demand id sufficient to absorb the increased production.

16. Discuss the role of costs in product-mix decisions. (Nov 2001)
Answer:
Role of costs in product mix decisions: All types of cost involved in cost accounting system are useful in decision making. The cost which plays a major role in product mix decision is the relevant cost. Costs to be relevant should meet the following criteria:

(i) The costs should be expected as future costs.
(ii) The costs differ among the alternatives course of action.

While making decision about product mix using the facilities and other available resources, the end results should always aim at profit minimisation. Variable costs are relevant costs in product mix decisions and consequently contribution plays a major role in minimisation of profit. In addition to the relevancy of costs, the other factors and costs that should be taken into account at the time of deciding the products mix are:

i. The available production capacity
ii. The limiting factor (s)
iii. Contribution per unit of the limiting factor
iv. Market demand for the products.
v. Opportunity costs

17. State the relative economics of the "makes vs. buy" decision in management control. (Nov 2001)
Answer:
The relative economics of the "make vs. buy" decision is management control:

Generally for taking a make vs. buy decision comparison is made between the supplier's price and the marginal cost of making plus the opportunity cost. Make vs. buy decision is a strategic decision, and, therefore, both short-term as well as well as long-term thinking about various cost and other aspects needs to be done.

A company generally buy a component instead of making it under following situations:

i. If it costs less to buy rather than to manufacture it internally;
ii. If the return on the necessary investment to be made to manufacture is not attractive enough;
iii. If the company does not have the requisite skilled manpower to make;
iv. If the concern feels that manufacturing internally will mean additional labour problem;
v. If adequate managerial manpower is not available to take charge of the extra work of manufacturing;

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vi. If the component shows much seasonal demand resulting in a considerable risk of maintaining inventories;
vii. If transport and other infrastructure facilities are adequately available;
viii. If the process of making is confidential or patented;
ix. If there is risk of technological obsolescence for the component such that it does not encourage capital investment in the component.

18. Mention the important factors to be considered in Marginal Costing Decisions.
Answer:
i. Whether the product or production makes a contribution.
ii. In the selection of alternatives, additional fixed costs if any should be considered.
iii. The continuity of demand after expansion & its impact on selling price are to be considered.
iv. Non-cost factors such as the need to keep labour force intact and government attitude are also to be taken into account.

19. What are the main points to be considered for Shut Down ?
Answer:
1. It is Temporary close down.
2. Fixed cost is continue (same in both cases) either continue or temporary closed down. than it is irrelevant.
3. Some fixed cost may be avoidable. Some fixed cost may be extra. Incurred to protect Machinery.
4. Calculate total loss if continue.

20. When should the decision to Shut Down Facilities be taken?
Answer:
(i) It is always in the interest of company to continue to operate the facilities as long as products or services sold recover variable cost and make some contribution towards recovery of fixed cost.
(ii) Shutdown of facilities does not eliminate all costs. Depreciation, interest, property, tax and insurance continue during complete inactivity.
(iii) If operations are continued, certain expenditure connected with shutdown will be saved.
(iv) It is in the interest of a company to continue the operations as long as differential costs or any amount above that can be obtained.

21. What are the disadvantages of Cost Plus Pricing ? (May'11)
Answer: Disadvantages of cost plus pricing:
(i) If ignores demand, facts to take into account buyers' needs and willingness to pay.
(ii) Fails to reflect competition adequately.
(ii) Assumes correct cost estimation, whereas in multiproduct firm, costs may be arbitrarily allocated.
(iv) In many decision, incremental costs are more relevant than full cost. This is ignored.
(v) Fixed Overheads depends on volume if volume is more cost is less, and vice-versa. Increase decrease in sales volume depends on price. Thus it is a vicious circle - cost plus markup is a price based on sales volume & sales volume is based on price.

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Assignment & Simulation

Assignment

1. In an assignment problem to assign jobs to men to minimize the time taken, suppose that one man does not know how to do a particular job, how will you eliminate this allocation from the solution? (Nov'09)

Answer: In an assignment minimization problem, if one task cannot be assigned to one person, introduce a prohibitively large cost for that allocation, say M, where M has a high the value. Then, while doing the row minimum and column minimum operations, automatically this allocation will get eliminated.

Simulation

1. What is simulation? State major reasons for using simulation technique to solve a problem and also describe basic steps in a general simulation process. (Nov06, June09)

Answer: Simulation is a quantitative procedure which describes a process by developing a model of that process and then conducting a services of organized trial and error experiments to predict the behaviour of the process over time.

Reasons:

i. It is not possible to develop a mathematical model and solutions with out some basic assumptions.
ii. It may be too costly to actually observe a system.
iii. Sufficient time may not be available to allow the system to operate for a very long time.
iv. Actual operation and observation of a real system may be too disruptive.

Steps: **(Nov'11)**

i. Define the problem or system which we want to simulate.
ii. Formulate an appropriate model of the given problem.
iii. Ensure that model represents the real situation/ test the model, compare its behaviour with the behaviour of actual problem environment.
iv. Identify and collect the data needed to list the model.
v. Run the simulation
vi. Analysis the results of the simulation and if desired, change the solution.
vii. Return and validate the simulation.

2. What are the advantages of Simulation?

Answer: Where making observations in a real situation may be expensive, very difficult, or a protracted exercise, and operating more than one set of real situation, all at a time, for the purpose of observing the alternative data is not feasible, the simulation technique comes handy with the aid of a computers that also generates random numbers. The time, cost and risk involved in the experimentation of a real environment, if practicable at all, are avoided and decision making becomes easier by observing the average of the results obtained by sufficient runs or replications of the set of data from theoretical population.

3. How would you use the Monte Carlo simulation method in inventory control? (May'08, Nov'10)

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Answer: The Monte Carlo Simulation:
It is the earliest mathematical Model of real situations in inventory control:

Steps involved in carrying out Monte Carlo simulation are:

- Define the problem and select the measure of effectiveness of the problem that might be inventory shortages per period.
- Identify the variables which influence the measure of effectiveness significantly for example, number of units in inventory.
- Determine the proper cumulative probability distribution of each variable selected with the probability on vertical axis and the values of variables on horizontal axis.
- Get a set of random numbers.
- Consider each random number as a decimal value of the cumulative probability distribution with the decimal enter the cumulative distribution plot from the vertical axis. Project this point horizontally, until it intersects cumulative probability distribution curve. Then project the point of intersection down into the vertical axis.
- Then record the value generated into the formula derived from the chosen measure of effectiveness. Solve and record the value. This value is the measure of effectiveness for that simulated value. Repeat above steps until sample is large enough for the satisfaction of the decision maker.

4. Outline the limitations of Simulation.
Answer: The limitations of simulation are

- Simulation generates a way of evaluating solutions but it does not generates the solutions techniques.
- Sometimes Simulation Models are expensive and may also takes a long time to develop them.
- A simulation Model does not produce answer by itself.
- Nor all situations can be evaluated using Simulation.
- It is a trail and error approach that produces different solution in repeated runs.
- Simulation is time –consuming exercise.

5. Simulation technique in CVP analysis under uncertainty :
Answer: CVP analysis is basically a study of how profits are influenced by the sales volume, prices and costs.

Thus an analysis of effect on P (profit volume) due to X (sales volume) price (p) and variable and fixed costs (V and F).

$$P = X (P – V) – F$$

In simple cases it may assumed that the values of the factors X, p, v and F are known precisely. Then it is a simple matter to evaluate profit P.

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Very often, in real-life situations, it is not possible to get exact estimates of the factors. These are subject to Uncertainties.

The uncertainties are expressed by specifying a statistical distribution of the variable. The uncertainties in each of the factors and their joint effects results in uncertainties on the profit volume. Thus the profit volume will also follow a statistical distribution. Study of CVP under such conditions of uncertainty forms the subject of this note.

Statistical distributions :

In some cases it may be possible to express the statistical distribution in sales, price, costs in mathematical probability distribution. If the mathematical distribution is assumed known (usually they will be assumed to be normally distributed) then using probability theory it would be possible to derive mathematically the probability distribution of the profit volume.

So simulated result = mean + s.d. × no. of deviations from mean
The deviation from mean is computed on the basis of random number.

6.Will the initial solution for a minimization problem obtained by Vogel's Approximation? (May'11)
Answer: The initial solution need not be the same under both methods.

Vogel's Approximation Method uses the differences between the minimum and the next minimum costs for each row and column.

This is the penalty or opportunity cost of not utilising the next best alterative. The highest penalty is given the 1st preference. This need not be the lowest cost.

For example if a row has minimum cost as 3, and the next minimum as 2, penalty is 1; whereas if another row has minimum 4 and next minimum 6, penalty is 2, and this row is given preference. But least cost given preference to the lowest cost cell, irrespective of the next cost.

Vogel's Approximation Method will to result in a more optimal solution than least cost. They will be the same only when the maximum penalty and the minimum cost coincide.

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Transportation

1. State the methods in which initial feasible solution can be arrived at in a transportation problem. (Nov'08)

Answer: The methods by which initial feasible solution can be arrived at in a transportation model are as under:

(i) North West Corner Method.
(ii) Least Cost Method
(iii) Vogel's Approximation Method (VAM)

2. How do you know whether an alternative solution exists for a transportation problem? (Nov'09)

Answer:

The Δ ij matrix = Δ ij = Cij – (ui + vj)

Where cij is the cost matrix and (ui + vj) is the cell evaluation matrix for allocated cell.

The Δ ij matrix has one or more 'Zero' elements, indicating that, if that cell is brought into the solution, the optional cost will not change though the allocation changes.

Thus, a 'Zero' element in the Δ ij matrix reveals the possibility of an alternative solution.

3. Explain the term degeneracy in a transportation problem. (Nov'09)

Answer: If a basic feasible solution of transportation problem with m origins and n destinations has fewer than m + n – 1 positive xij (occupied cells) the problem is said to be a degenerate transportation problem. Such a situation may be handled by introducing an infinitesimally small allocation e in the least cost and independent cell.

While in the simple computation degeneracy does not cause any serious difficulty, it can cause computational problem in transportation problem. If we apply modified distribution method, then the dual variable ui and vj are obtained from the Cij value to locate one or more Cij value which should be equated to corresponding Cij + Vij.

4. What is procedure to be followed in obtaining an optimal solution under Transportation Model:

Answer:

- Find initial basic feasible solution by using either North-west corner method or least cost method or Vogel's Approximation Method.
- Check the number of occupied cells for satisfying the rule m + n – 1.
- For each occupied cell by the current solution, solve the system of equations i.e. ui + vj = Cj.
- Compute the net evaluation for all unoccupied cells.
- Examine the sign of each Zj-Cj. If all Zj-Cj ≤ 0, then the current solution is optimal.
- If the above is not satisfied, identify the loops and make allocation till Z1-C1 is ≤ 0.

5. In an unbalanced minimization transportation problem, with positive unit transport costs from 3 factories to 4 destinations, it is necessary to introduce a dummy destination to make it a balanced transportation problem. How will you find if a given solution is optimal ? (May'10)

Answer: Test for optimality: number of allocation = m + n – 1 where there are m rows and n columns. The allocations are independent i.e., if no loop can be formed by them. Here, no. of factories + no. of destination + dummy – 1 = m +n + 1 – 1 = 3 + 4 +1 – 1 =7.

There should be exactly 7 allocation to satisfy (i) above.

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Network Analysis

Some important definition:

i. Activity : It is a particular work of a project which consumes some resources & time. It is shown as & Represented by Capital Letter.

ii. Event : It denotes the start & end of an activity & represented by a "circle". Events are no as 1, 2, 3 etc. So that it moves from lower to higher number.

iii. Every project starts with a single event & ends at a single event. No properly to show move from L to R.

iv. Sequence : Activities are linked in a sequence known as immediate predecessor i.e. an activity which must be completed first to start another one

v. Between two events there must be only one activity.

vi. Dummy Activity is required to solve the problem when two or more activities are there between two events. It is denoted as a dotted line (…….>)

vii. Path: A series of activities taken together to link the first & end event.

viii. Critical Path: The longest path is known as critical path & represented by thick line or double lines. All activities lying in this critical path are called critical activities. Any delay in their execution will lead to a delay in the completion of the entire project.

1. Define project. State some of its characteristics.

Answer: A project can be defined as a set of activities or jobs that are performed in a certain sequence determined logically or technologically and it has to be completed within (i) a specified time, (ii) a specified cost and (iii) meeting the performance standards .

Examples of a project from fairly diverse fields could be cited . Some of them are given below :

1. Introducing a new product in the market.
2. Construction of a new bridge over a river or construction of a 25 storied building.
3. Executing a large and complex order on jobbing production.
4. Sending a space craft to the mars.

All these projects are characterised by the following set of common implications, although they pertain to widely different fields.

The large-scale characteristic : These projects are generally unusually large and complex. Thousands of suppliers, workers and other categories of persons are involved and their efforts have to be co-ordinate for completion of the project.

i. **The non-recurring characteristic :** These projects are generally of a one time nature. Neither in the past, nor in the future they are likely to be undertaken substantially in the same form.

ii. **Uncertain and critical dates :** Duration of the various activities involved in such projects are usually uncertain. Further in such type of projects, many critical dates exist by which operations must be completed in order to complete the entire project on schedule.

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iii. **Completion dead line :** The fourth distinct feature of these projects is that there is dead line for the completion of the entire project. In case of any delay in the completion of the project, some penalty is levied for such delay beyond the dead line.

2. Explain the terms Resource Smoothing and Resource Leveling. (Nov'04)
Answer:
Resource smoothing:

i. Resource refers to materials, men, machinery, money, methods, etc. used in the activities of a project. Different activities require different quantum of resources. The resource requirement on any day in a project may not be uniform e.g. 10 men required on the first day, 6 men required on the fourth day, etc.

ii. Resource Smoothing is a network technique used for smoothening peak resource requirements during different periods / activities of a project network.

iii. In Resource Smoothing, the total project duration is maintained at the expected level i.e, normal duration.

iv. The resources required for completing different activities of a project are smoothened (averaged) by utilizing floats available on non – critical activities.

v. Non – critical activities having floats are rescheduled or shifted so that a uniform demand on resources is achieved.

vi. The Activity with the maximum total float is generally considered first for rescheduling / postponing

vii. The Critical Path activities should not be rescheduled since Total Float = Zero and no Project Duration will be extended in such a case.

Resource Leveling:

i. The Critical Path gives the maximum duration of the project when there is no resource constraint situation. However, when there are bottlenecks in the availability of resources, the project may get delayed.

ii. Resource Levelling / Allocation is a net work technique used for determining the project duration, when there are restrictions on the availability of resources.

iii. Resource Levelling utilises the large floats available on non critical activities of the project and cuts down the demand on resources. The maximum demand of a resource should not exceed the available limit at any point of time. In order to achieve this, non critical activities are rescheduled by utilizing their floats.

iv. The use of Resource Levelling may lead to increase in the completion time of the project.

3. What are the advantages of Critical Path Analysis?
Answer:

i. It allows for a comprehensive view of the entire project. Because of the sequential and concurrent relationships, time scheduling becomes very effective. Identifying the critical activities keeps the executive alert and in a state of preparedness, with alternative plans ready in case these are needed. Breaking down the project into smaller components permits better and closer control.

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ii. Critical path analysis offers economical and effective system of control based on the principle management by exception i.e. need for corrective action arises only exceptional situations and in most of other cases, performance is in conformity with the plans.

iii. It is a dynamic tool of management which calls for constant review, a reformulation of the network, and finding the current path of relevance and optimum resources allocations.

iv. Time Scaled Diagrams : In the network diagrams which we have considered, it has been stressed that the length of the individual arrows has no relation to the duration of the activity which each arrow represented. It is of course possible to draw the arrows to a time scale, and this can be a very useful method of presentation for small networks.

4. A FEW COMMENTS ON ASSUMPTIONS OF PERT & CPM ? (Nov'11)
Answer:

i. Beta distribution may not always be applicable.

ii. The formulae for the expected duration and S.D. are simplifications.

iii. The errors owning to the aforesaid simplification and assumption may be compounded or may cancel each other to an extent.

iv. In computing the S.D. of the critical path independence of activities is implied. Limitations of resources may invalidate the independence which exists by the very definition of an activity.

v. It may not always be possible to sort out completely identifiable activities and to state where they begin and where they end.

vi. Time estimates have an element of subjective-ness and, to that extent, the techniques could be weak.

5. Explain the following in the context of a network: (4 Marks)
(i) Critical path (June'09)
Answer: Critical Path is a chain of activities that begin with the starting event and ends with ending event of a particular project. It is that path that runs through a network with the maximum length of time or it indicates the maximum possible time required for completion of a project. Critical path indicates the minimum time that will be required to complete a project. It is determined after identifying critical events. Critical path goes through critical events.

6. Distinction between PERT and CPM (Nov'00, May'11)
Answer:

PERT	CPM
1. PERT is used for non-repetitive jobs like planning the assembly of the space.	1. CPM is used for repetitive job like building a house
2. It is a probabilistic model.	2. It is a deterministic model.
3. It is event-oriented as the results of analysis are expressed in terms of events or distinct points in time indicative of progress.	3. It is activity-oriented as the result or calculations are considered in terms of activities or operations of the project.
4. It is applied mainly for planning and scheduling research programmes.	4. it is applied mainly for construction and business problems.
5. PERT incorporates statistical analysis and thereby determines the probabilities	5. CPM does not incorporate statistical analysis in determining time estimates,

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concerning the time by which each activity or entire project would be completed.

6. PERT serves as useful control device as it assists management in controlling a project by calling attention to such delays which might lead to delay in project completion.

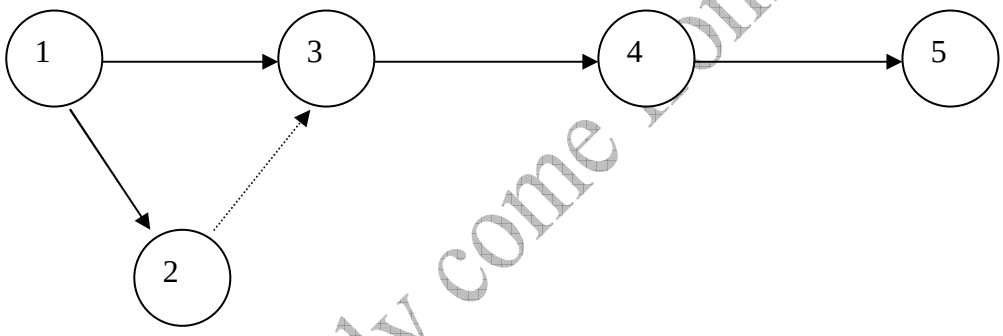
because time is precise and known.

6. It is difficult to use CPM as a control device for the simple reason that one must repeat the entire evaluation of the project each time the changes are introduced into the network.

7. What do you mean by a dummy activity? Why is it used in networking? (May'08, June'09)
Answer: Dummy activity is a hypothetical activity which consumes no resource or time. It is represented by dotted lines and is inserted in the network to clarify an activity pattern under the following situations.

i. To make activities with common starting and finishing events distinguishable.
ii. To identify and maintain the proper precedence relationship between activities that are not connected by events.
iii. To bring all "loose ends" to a single initial and single terminal event.

e.g.



Dummy (2) – (3) is used to convey that can start only after events numbered (2) and (3) are over:

8. Brief the principles associated with synchronous manufacturing? (May'10)
Answer: Synchronous Manufacturing
It is an all encompassing manufacturing management philosophy which includes a set of principles, procedures and techniques where every action is evaluated in terms of common goals of the organization.

The seven principles are:
i. Focus on synchronizing the production flow than on idle capacities.
ii. Value of time at a bottleneck resource is equal to the throughput rate of products processed by the bottle neck.
iii. Value of time at a non bottleneck resource is negligible.
iv. Level of utilization of a non bottleneck resource is controlled by other constraints within the system.
v. Resources must be utilized, not simply activated.
vi. Transfer batch should not be equal to the process batch.
vii. A process batch should be variable both along its route and overtime.

9. A Project Manager has to manage various projects. For each project given below, you are required to advise him whether to use PERT or CPM and briefly state the reason? (May'10)

1. Project K is yet to begin. The manager has recently successfully handled similar projects. He is able to break down the project into similar modules and knows when he may comfortably finish each module.

25 Marks Theory surely come from this material

2. Project L has been sanctioned some fixed amount. Though the manager is familiar about what time it will take, he expects pressure towards the end to finish the project slightly earlier, by deploying additional resources of the company.
3. Project M is new to the manager. He has never handled such a project. He can break up the project into smaller modules, but even then, he is not sure of their exact times.
4. Project N has a limitation on the skilled workforce available. But the manager knows from earlier experience, the slack on each event in the project. He is confident of handling the bottleneck of labour.
5. Project O is a research project, bound to produce immense benefits to the company in future.

Answer:

Project	To use	Reason
K	CPM	No uncertainty regarding timing of activities.
L	CPM	Known timing; optimal crashing required.
M	PERT	Unknown activity timing; Probabilistic model is necessary.
N	CPM	Known activity timing; Limited availability of skilled labour, calls for resource smoothening.
O	PERT	Research Project; uncertainty about of timing of activities

10. List the 5 steps involved in the methodology of Critical Path Analysis. (Nov'10)

Answer: The working methodology of PERT which includes both CPM and PERT, consists of following five steps:

a) Analyze and break down the project in terms of specific activities and/or events.

b) Determine the interdependence and sequence of specific activities and prepare a network.

c) Assign estimates of time, cost or both to all the activities of the network.

d) Identify the longest or critical path through the network.

e) Monitor, evaluate and control the progress of the project by re-planning, rescheduling and reassignment of resources.

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Learning Curve

A **Learning curve** is a function that measures how labour-hours per unit decline as units of production increase because workers are learning and becoming better at their jobs. Managers use learning curves to predict how labour-hours, or labour costs, will increase as more units are product. The aircraft assembly industry first documented the effect that learning has on efficiency. In general, as workers become more familiar with their tasks, their efficiency improves. Managers learn how to improve the scheduling of work shifts. Plant operators learn how best to operate the facility. As a result of improved efficiency, unit costs decrease as productivity increases, and the unit-cost function behaves non-linearly. These non-linerities must be considered when estimating and predicting units costs. Managers are now extending the learning curve notion to other business functions in the value chain, such as marketing, distribution, and customer service, and to costs other than labour costs. The term experience curve describes this broader application of the learning curve. An Experience curve is a function that measures the decline in cost per unit in various value chain functions such as marketing, distribution, and so on, as units produced increase.

Experience curves Experience curves are very similar to learning curves. Learning curves deal only with labour hours and therefore labour cost reducing by a set percentage. But experience curves cover all costs and yet they are very similar in percentage terms to learning curves. All costs reduce with experience to some extent. Material costs may decrease slightly with quantity discounts etc., but will not decrease by a large amount. Variable overheads often follow the pattern of direct labour and so may decrease in a similar way. Fixed overheads will decrease per unit as more units are made and can also decrease by a substantial amount per unit.

Uses of Learning curve.
Knowledge of learning curve helps in cost predications. Its main uses include :

i. L.C. helps in analysing cost-volume profit relationship and is useful for cost estimates and forecasting

ii. L.C. helps in budgeting and profit planning

iii. L.C. helps in pricing, particularly in a tender when it is known that the tender consists of several repetitive jobs

iv. L.C. helps design engineers in making decision, based upon expected rates of improvement.

v. L.C. helps in setting standards in learning phase

vi. L.C. knowledge helps in manpower planning for contract of long duration or for repetitive clerical work.

vii. LC suggest great opportunities for cost reduction to be achieved by improving learning.

viii. LC concept provides a means of evaluating the effectiveness of training programs

Limitations to the usefulness of the learning curve: **(Nov'11)**

i. The learning curve is useful only for new operations where machines do not constitute a major part of the production process. It is not applicable to all productions. E.g. new and experienced workmen.

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ii. The learning curve assumes that the production will continue without any major interruptions. If for any reason the work in interrupted, the curve may be deflected or assume a new slopes.

iii. Changes other than learning may effect the learning curve. For example, improvement in facilities, arrangements, and equipment as well as personnel morale and performance may be factors influencing the curve. On the other hand, negative developments in employee attitudes may also affect the curve and reverse or retard the progress of improvement.

iv. The characteristic 80 percent learning curve as originally obtaining in the air force industry in U.S. A. has been usually accepted as the percentage applicable to all industries. Studies show that there cannot be a unique percentage which can be universally applied.

Factors affecting Learning Curve:

i. While pricing for bids, general tendency is to set up a very high initial labour cost so as to show a high learning curve. This makes the learning curve useless and sometimes misleading.

ii. The method of production, i.e. whether it is labour oriented or machine oriented influences the slop of the learning.

iii. When labour turnover rate is high management has to train new workers frequently. In such situations the company may never reach its maximum efficiency potential. One of the important requisites of the learning curve concept is that there should be uninterrupted flow of work. The fewer the interruptions, the grater will be the improvement in efficiency.

iv. Changes in a product or in the methods of production, designs, machinery, or the tools/used affect the slope of the learning curve. All these have the effect of starting learning a fresh because of new conditions If the changes are frequent, there may be no learning at all.

v. Also other factors influencing the learning curve are labour strikes, lock outs and shut downs due to other cause also/affect the learning curve. In each such case there is interruption in the progress of learning.

1. Explain the concept 'Learning curve'. How can it be applied for Cost Management? (May'06)
Answer: The first time when a new operation is performed, both the workers and the operating producers are untried. As the operation is repeated and the workers become more familiar with work, labour efficiency increases and the labour cost per unit declines. This process continues for some time and a regular rate of decline in cost per unit can be established. This rate can be used to predict further labour costs. The learning process starts from the point when the first unit comes out of the production line. In other words 'Learning Curve' is a function that measures how labour hours per unit decline as units of production increase because workers are learning and becoming better at their jobs.

Cost Management Application:

i. Learning curve is useful in analyzing cost volume profit relationship. The company can set low price of its product to generate high demand. As the production increases, cost per unit drops.

ii. It helps in budgeting and profit planning.

25 Marks Theory surely come from this material

iii. It enables the company in price fixation. In particular, the company can fix a lower price for repeat orders.

iv. It helps the design engineers to take suitable decisions based on expected rates of improvement.

v. It helps in price negotiations.

vi. It is useful in setting standards and in performance evaluation.

2. What are the distinctive features of learning curve theory in manufacturing environment? Explain the learning curve ratio. (Nov'06, Nov'07, Nov'10)

Answer: As the production quantity of a given item is doubled, the cost of the item decreases at a fixed rate. This phenomenon is the basic premise on which the theory of learning curve has been formulated. As the quantity produced doubles, the absolute amount of cost increase will be successively smaller but the rate of decrease will remain fixed. It occurs due to the following distinctive features of manufacturing environment:

i. Better tooling methods are developed and used.

ii. More productive equipments are designed and used to make the product.

iii. Design bugs are detected and corrected.

iv. Engineering changes decrease over time.

v. Earlier teething problems are overcome.

In the initial stage of a new product or a new process, the learning effect pattern is so regular that the rate of decline established at the outset can be used to predict labour cost well in advance. The effect of experience on cost is summarized in the learning curve ratio or improvement ratio.

$$\text{Learning curve ratio} = \frac{\text{Average labour cost of first 2N units}}{\text{Average labour cost of first N units}}$$

For example, if the average labour cost for the first 500 units is Rs. 25 and the average labour cost for the first 1,000 units is Rs. 20, the learning curve ratio is (Rs. 20/25) or 80%. Since the average cost per unit of 1,000 units is Rs. 20, the average cost per unit of first 2,000 units is likely to be 80% of Rs. 20 or Rs. 16

3. Discuss the application of the learning curve. (May'07)

Answer: Application of Learning Curve: Learning Curve helps to analyse cost-volume profit relationships during familiarization phase of product or process to arrive at cost estimates.

It helps in budgeting and profit planning.

It helps in pricing and consequent decision making- e.g. acceptance of an order, negotiations in establishing contract prices etc. with the advantage of the knowledge of decreasing unit cost.

It helps in setting standards in the learning phase.

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Linear Programming

1. What are the practical applications of Linear Programming? (May'07)
Answer: Linear programming can be used to find optional solutions under constraints.

In production:

-- Product mix under capacity constraints to minimize costs/maximize profits along with marginal costs.

-- Inventory management to minimize holding cost, warehousing/transporting from factories to warehouses etc.

Sensitivity Analysis: By providing a range of feasible solutions to decide on discounts on selling price, decisions to make or buy.

Blending: Optional blending of raw materials under supply constraints.

Finance: Portfolio Management, interest/receivables management.

Advertisement mix: In advertising campaign- analogous to production management and production mix.

Assignment of personal to jobs and resource allocation problems.

However, the validity will depend on the manager's ability to establish a proper linear relationship among variables considered.

2. List out the accounting and financing areas where Linear Programming can be used.
Answer: Accounting and financing areas where Linear Programming can be used :

Allocation problems are concerned with the utilisation of limited resources to best advantage.

Linear Programming (LP) is a mathematical technique to optimise the value of some objective e.g., maximum profit or minimum cost, when the factors involved, say labour or machine hours, are subject to some constraints :

LP can be used in solving resource allocation problems in any area, including accounting and finance, provided that the problem meets the following requirements :

i. The problem must be capable of being stated in numeric terms.
ii. All factors involved in the problem must have linear relationship.
iii. The problem must permit a choice or choices between alternative course of action.
iv. There must be one or more restrictions on the factors involved.

Specific examples in the accounting and finance areas include :

i. Capital investment and project appraisal particularly relating to capital rationing problems.
ii. Maximising contribution or minimising cost decisions involving production planning, product mix and similar problems.
iii. Transfer pricing problems and elements of corporate strategy formulation.

3. Degeneracy in linear programming.
Answer: Degeneracy in LP may arise :

(A) at the initial stage and
(B) at any subsequent iteration stage.

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In case (A), at least one basic variable is zero in the initial basic feasible solution. In case (B) at any iteration of the simplex method more than one vector is eligible to leave the basis and hence the next simple iteration produces a degenerate solution in which at least one basic variable is zero. This means that the subsequent iterations may not produce improvements in the value of the objective function.

4. Discuss, with examples, the industrial and management applications of linear programming.

Answer.

a. By Industrial applications of LP.
b. Product Mix
c. Production scheduling
d. Blending
e. Transportation
f. Trim Loss
g. Management application of LP
h. Portfolio selection
i. Financial Mix
j. Profit Planning
k. Media selection
l. Travelling salesman.

5. Explain briefly the four major types of allocation problems which can be solved using linear programming technique.

Answer: Four major types of allocation problems using LP technique are :

i. Transportation problem – Distribution of commodities to warehouses.
ii. Assignment problem - Allocation of machines to jobs.
iii. Product mix problem - Optimal product mix to maximise contribution.
iv. Blending problem – Optimal blending of raw materials to minimise cost of cotton blending.

6. Discuss the scope and limitations of linear programming as an aid to managerial decision-making.

Answer. A linear programming problem is basically that of maximising or minimising an objective function subject to a set of constraints of the forms " less-than-or-equal to " / " greater-than-or-equal to " / " equal to " on the variables. In practical problems an additional restriction of non-negativity of the variables is imposed.

This structure models stems from the assumptions :

Proportionality: The unit cost / profit is independent of the activity level. The usage of resources per unit activity is independent of the activity level.

Additivity: The total cost / profit and the total usage of a resource is the sum of costs / profit or sum of resources for each of the activity.

Divisibility: The resources may be allocated to the activities in any proportions whatsoever. this results in the condition that the values of variables may take any rational number.

Non-negativity: It is usually assumed that variables will have to be non-negative. Through this condition can be relaxed at times.

Certainty: It is assumed that the data figures of cost / profit, resources and usage of resources are known with certainty.

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Thus any decision problem satisfying the above assumptions (often nearly the assumptions in practical terms) can be formulated as a liner program and the optical decision found.

However, in many problems of real life, one or more of the above assumptions may not be maintained. In such problems Linear programming methods cannot be applied.

7. Distinguish between a slack variable and an artificial variable in linear programming.
Answer:
Slack variable:
In order to convert every constraint of the type less than equal to in a LP problem into an equality constraint, so that solution of the problem can be arrived, we add a variable to each such constraint. The variable so added in each constraint is known as slack variable. A slack variable always non negative. Example

Artificial variable:
In order to convert constraints of the type 'greater than equal to' equality for finding the solution of the L. P. problem, we first subtract a surplus variable and then add a variable. This variable is also added in the constraints of the type 'equal to' start with the initial feasible solution. The variable added in the constraints as explained above is known as artificial variable. Artificial variables are always positive.

8. Write short notes on applications and limitation of Linear Programming Techniques. (Nov 2000)
Answer:
Application of Linear Programming: Linear programming was developed from 1947 onwards as a tool for finding optimal solutions to military planning problems. The early applications were restricted to problems involving military operations such as logistics, transportation and procurement, successful military applications led to business uses. Present day users range from agriculture, business and industry to government with the most extensive applications being those in industry and commerce. For example, problems involving blending of petroleum, animal feed blending, production planning and inventory control, problems determining optimal product mix, problems dealing with training and assignment of personnel, transport of commodities and allocation of funds are some of the areas of business applications of linear programming.

Limitations of Linear Programming: Important limitations of linear programming problems are as follows:

a) A primary requirement of linear programming is that the objective function and every constraint function must be linear. This requires that the measure of effectiveness and resource usage must be proportional to the level of each activity conducted individually. However, programming problems which are non-linear arise quite frequently. It is occasionally possible to reformulate a non-linear programming problem into the linear programming format so that the simplex method can be used. This, however, is the fortunate exception rather than the rule.

b) It may not be possible to solve those problems using linear programming in which nonlinearity arises because of joint interactions between some of the activities regarding the total measure of effectiveness or total usage of some resource. Hence, linear programming problem requires that the total measure of effectiveness and total resource usage resulting from the joint performance of the activities must equal the respective sums of these quantities resulting from each activity being performed individually. In some

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situations, it may not be true. For example, consider a situation where a byproduct is produced with the scrap material from two primary products. The material would still have to be produced it only one of the two products were produced. However, the total material requirements if both products are produced is less than the sum of requirements if each were produced individually. It may not be possible to handle such situations with linear programming problems.

c) In linear programming problem, fractional values are permitted for the decision variables. However, many decision problems require that the solution for decision variables should be obtained in non-fractional values. Rounding-off the values obtained by linear programming techniques may not result into an optimal solution in such cases.

d) In linear programming problems, coefficients in the objective function and the constraint equations must be completely known and they should not change during the period of study i.e. they should be known constraints. In practical situation, it may not be possible to state all coefficients in the objective function and constraints with certainty. Furthermore, these coefficients may actually be random variables, each with an underlying probability distribution for the values. Such problems cannot be solved suing linear programming.

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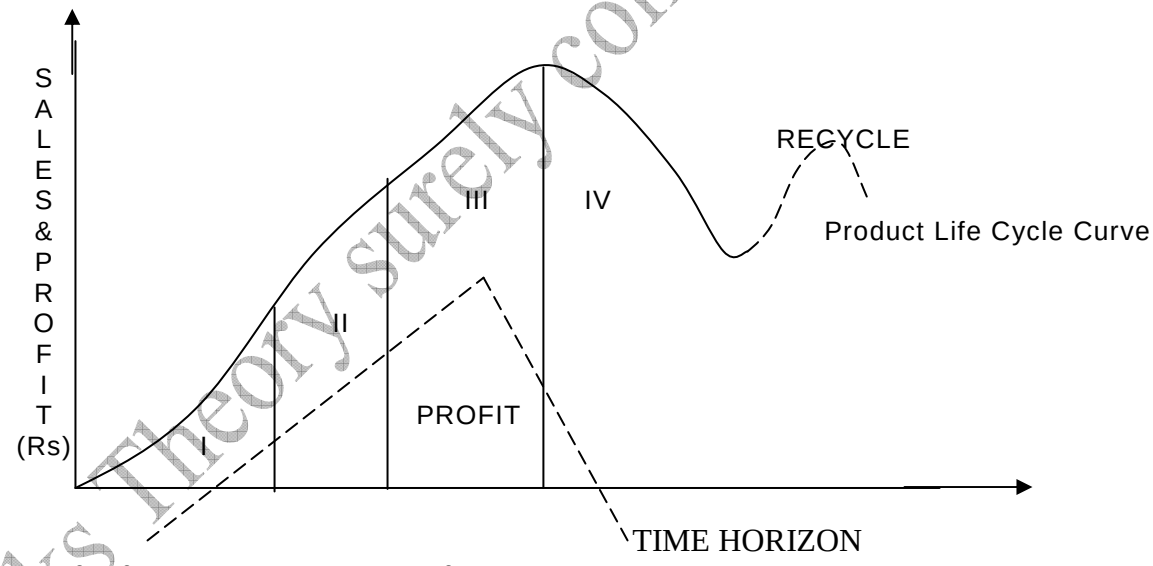
Life Cycle Costing

Life cycle costing is a methodology for calculating the whole cost of a system from inception to disposal. The system will vary from industry to industry and could for instance be a building, a ship, a weapon system or a power station. Whatever the system, the life cycle costing technique will be the same, the major items of cost will be defined through its life. These items could include research and development, construction, operation and maintenance and disposal.

The items may be further subdivided until the cost of each element can be defined as a mathematical equation. At a simple level this may be the number of man-hours multiplied by a cost rate. The elements of cost will then be added together to give the total cost for each item and a grand total for the system through its full life. As the project develops you will want to alter your life cycle cost analysis model accordingly and you will also want to carry out sensitivity studies and cost trade off studies. Each of these will be require a recalculation of the model.

So, Life cycle costing is a technique which takes account of the total cost of making a product or owning a physical asset, during its economic life.

The production and sale of many products follow a cycle over their economic lives. Normally, sales start out slow, expand rapidly as the product is popularised and then drop off rapidly as a better product becomes available or a new product emerges in the market. Therefore, each product takes a number of years (accounting periods) to complete the cycle. The figure given below shows through different phases in the life cycle, a product too has similar phases.



Phases of Life Cycle: Revenue & Profit **(Nov'11)**

Stage	I	Introduction (childhood)
	II	Growth (Adulthood)
	III	Maturity (Manhood)
	IV	Decline (Old age and death)

The length of the product cycle is governed by the rate of

(a) technological change
(b) market acceptance and
(c) competition.

The concept of life cycle costing involves:

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i. identify product life cycle and estimating number of units to be produced per period over the life cycle of the product;

ii. estimating the costs involved for the same; and

iii. determining the average cost of production over the product life.

Importance: (May'06)
Product life cycle costing is important for the following reasons:

i. When non-production costs like costs cost associated with R & D, design, marketing, distribution and customer service are significant, it is essential to identify them for target pricing, value engineering and Cost Management. For example, a poorly designed software package may involve higher costs on marketing, distribution and after sale service.

ii. There may be instances where the pre-manufacturing costs like R & D and design are expected to constitute a sizeable portion of life cycle costs. When a high percentage of total life cycle costs are likely to be so incurred before the commencement of production, the firm needs an accurate prediction of costs and revenues during the manufacturing stage to decide whether the costly R & D and design activities should be undertaken.

iii. Many costs are locked in at R & D and design stages. Locked in or Committed costs are those costs that have not been incurred at the initial stages of R & D and design but that will be incurred in the future on the basis of the decisions that have already been taken. For example, the adoption of a certain design will determine the product's material and labour inputs to be incurred during the manufacturing stage. A complicated design may lead to greater expenditure on material and labour costs every time the product is produced. Life cycle budgeting highlights costs throughout the product life cycle and facilitates value engineering at the design stage before costs are locked in.

Total life cycle costing approach accumulates product costs over the value chain. It is a process of managing all costs along the value chain starting from product's design, development, manufacturing, marketing, service and finally disposal.

Stages of product life cycle

i. **Market research:** It identified – the products which customers wants, how much they are prepared to pay for it and how much quantity they intend to buy.

ii. **Specification:** It provides details such as required life; maximum permissible maintenance costs, manufacturing costs, units required, delivery date, expected performance of the product.

iii. **Design:** Proper drawings and process schedules are defined.

iv. **Prototype manufacture:** Prototype may be used to develop the product and eventually to demonstrate that it meets the requirements of the specifications.

v. **Development:** Testing and changing to meet the requirements after the initial run as a product when first made rarely meets the specification.

vi. **Tooling:** Tooling up for production means building a production line, building expensive jigs, buying the necessary tool and equipments.

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vii. **Manufacture:** It involves the purchase of raw material and components., use of labour to make and assemble the product.

viii. **Selling:** Stimulating and creating demand for the product when the product is available for sale.

ix. **Distribution:** The product should be distributed to the sales outlets and to the customers.

x. **Product support:** The manufacturer or supplier should make sure that spares and expert servicing facilities are available for the entire life of the product.

xi. **Decommissioning:** When a manufacturing product comes to an end, the plant used to build the product must be sold or scrapped.

Benefit of product life-cycle costing.

i. It results in earlier action to generate revenue or to lower costs than otherwise might be considered. There are a number of factors that needs to be managed in order to maximize return on a product.
ii. Better decisions should follows from a more accurate and realistic assessment of revenues and costs, within a particular life cycle stage.
iii. It can promote long term rewarding in contrast to short term profitability rewarding.
iv. It provides an overall framework for considering total incremental costs over the entire life span of a product.

Uses of PLC :

i. as a Planning tool, it characterises the marketing challenges in each stage and poses major alternative strategies. i.e. application of Kaizen.
ii. as a Control tool, the launched PLC concept allows the company to measure product performance against similar products launched in the past.
iii. as a Forecasting tool, it is less useful because sales histories exhibit diverse patterns and the stages vary in duration.

1. What is total-life-cycle costing approach?

Answer:

Life cycle costing estimates, tracks and accumulates the costs over a product's entire life cycle from its inception to abandonment or from the initial R & D stage till the final customer servicing and support of the product. It aims at tracing of costs and revenues on product by product basis over several calendar periods throughout their life cycle. Costs are incurred along the product's life cycle starting from product's design, development, manufacture, marketing, servicing and final disposal. The objective is to accumulate all the costs over a product life cycle to determine whether the profits earned during the manufacturing phase will cover the costs incurred during the pre and post manufacturing stages of product life cycle.

2. What is product life cycle costing? What are the costs that you would include in product life cycle cost? (May'07)

Answer: It is an approach used to provide a long-term picture of product line profitability, feedback on the effectiveness of the life cycle planning and cost data to clarify the economic impact on alternatives choices in the design, engineering phase etc. It is also considered as a way to enhance the control of manufacturing costs. It is important to track and measure costs during each stage of a product's life cycle.

The costs are included in different stages of the product life cycle.

Development phase: R & D cost/Design cost.

25 Marks Theory survey come from this material

Introduction phase: Promotional Cost/Capacity costs.
Growth phase/Maturity: Manufacturing Cost/Distribution Costs/Product support cost.
Decline /Replacement phase: Plants reused/sold/scrapped/related costs

3. Describe characteristics and benefits of Product Life Cycle costing. (Nov'00, May'10)
Answer:
Product life cycle costing.
It is an approach used to provide a long-term picture of product line profitability, feedback on the effectiveness of the life cycle planning and cost data to clarify the economic impact on alternatives choices in the design, engineering phase etc. It is also considered as a way to enhance the control of manufacturing costs. It is important to track and measure costs during each stage of a product's life cycle.

Characteristics:-

i. Product life cycle costing involves tracing of costs and revenues of each product over the several calendar periods throughout their entire life cycle.

ii. Product life cycle costing traces research and design and development costs and total magnitude of these costs for each individual product and compared with product revenue.

iii. Report generation for costs and revenues.

Benefits: -

i. The product life cycle costing results in earlier actions to generate revenue or to lower cost than otherwise might be considered.

ii. Better decision should follow from a more accurate and realistic assessment of revenues and costs, at least within a particular life cycle stage.

iii. Product life cycle thinking can promote long-term rewarding in contrast to short-term profitability rewarding.

iv. It provides an overall framework for considering total incremental costs over the life span of a product.

4. Explain the essential features of Life-cycle costing. (June'09)
Answer: Essential features of Life Cycle Costing:

- Tracing of costs and revenue of product over several calendar period. Throughout their entire life cycle.
- Emphasis is on Cost and revenue accumulation over the entire life cycle of the product.
- Life cycle costing traces research and design.
- It focus on development costs, incurred to individual products over their entire life cycles.
- Total magnitude of research and development costs are reported and compared with product revenues generated in later periods.

5. Meena is a news reporter and feature writer for an economic daily. Her assignment is to. develop a feature article on 'Product Life-cycle Costing', including interviews with the' Chief Financial Officers (CFO) and operating, managers. Meena has been given a liberal budget for travel so as to research into company's history, operations, and market analysis for the firm she selects for the article. (June 09)

25 Marks Theory surely come from this material

Answer: The product life cycle span the time from the initial R & D on a product to when customer service and support is no longer offered for that product.

Life Cycle Costing technique is particularly important when:

i. High percentage of total life-cycle costs are incurred before production begins and revenue are earned over several years and

ii. High fraction of the life cycle costs are locked in at the R & D and design stages.

Meena should identify those industries and then companies belonging to those industries where above mentioned feature are prevalent. For example, Automobile and Pharmaceutical Industries companies like Tata Automobile, M&M, Ranbaxy and Dabur will be good candidates for study on product life cycle costing.

6. Summarise the product life Cycle (PLC) characteristics and state how the PLC concept is used by marketing manager product and market dynamics.

Answer: The stage wise characteristic can be summarised as follows :

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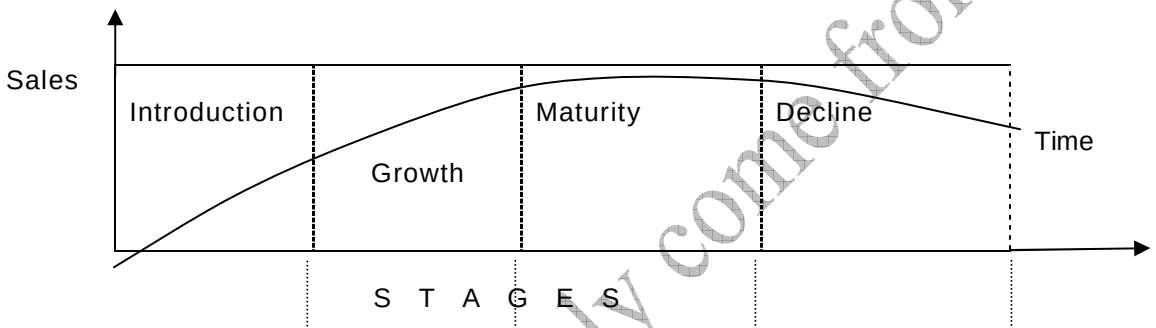

Low Sales	Rapidly Rising Sales	Peak Sales	Declining Sales	Sales
High Cost Per Customer	Average Cost per Customer	Low cost Per Customer	Low cost Per Customer	Cost
Negative	Rising Profit	High Profit	Decline Profit	Profits
Innovators	Early Adopters	Middle Majority	Laggards	Customer
Few	Growing Number	State Number	Declining Number beginning to Decline	Competitors

25 Marks Theory surely come from this material

J.I.T. , M.R.P. & E.R.P.

JIT System (Nov'08)

Just –in-time (JIT) production (also called lean production) is a " demand- pull" manufacturing system in which each component in a production line is produced immediately as need in which by the next step in the production line. In a JIT production line, manufacturing activity at any particular workstation is promoted by the need for that station's output at the following station. Demand triggers each step of the production process, starting with customer demand for a finished product at the end of the process and working all the way back to the demand for direct materials at the beginning of the process. In this way, demand pulls and order through the production line.

The demand-pull features of JIT production systems, achieve close coordination among workstations. It smoothes the flow of goods, despite low quantities of inventory. JIT production systems aim to simultaneously

(1) meet customer demand in a timely way
(2) with high-quality products and
(3) at the lowest possible total cost.

Companies implementing JIT production systems manage inventories by eliminating (or least minimizing) them.

Features, benefits, Pre-requisites & Effect of JIT?

Features :

a) Low or Zero inventories; emphasis on operation from source to customer .
b) Emphasis on customer service and timing.
c) Short of operations.
d) Flexibility of operations.
e) Efficient flow
f) Use of kanban and Visibility.

Benefits :

a. Reduce inventories and WIP
b. Reduce space requirements, set up time
c. Shorter throughput times
d. Greater employees involvement, participation and motivation
e. Smooth work force
f. Greater productivity
g. Improved product /service quality
h. Improved customer service and smaller batch size.
i. More uniform loading of facilities.

Pre –requisites of JIT:

(i) Low variety
(ii) Demand stability
(iii) Vendor reliability
(iv) Defect free materials.
(v) Good communication
(vi) Preventive maintenance
(vii) Total quality control.

Desirable factor of JIT :

(i) Management commitment
(ii) Employee investment.
(iii) Employee flexibility.

25 Marks Theory surely come from this material

1. Effect of using JIT (Just in Time) in Inventory Control.
Answer:

i. saves cost due to lead time
ii. saves cost due to holding inventory like insurance, spoilage, obsolescence etc.
iii. does away with locking up of funds in inventory
iv. helps very much in working capital management

2. Explain, how the implementation of JIT approach to manufacturing can be a major source of competitive advantage. (Nov'08, Nov'11)
Answer: JIT provides competitive advantage in the following ways:

i. Stocks of raw materials and finished goods are eliminated, stock holding costs are avoided.

ii. JIT aims at elimination of non-value added activities and elimination of cost in this direction will improve competitive advantage.

iii. It affords flexibility to customer requirements where the company can manufacture customized products and the competitive advantage is thereby improved.

iv. It focuses the direction of performance based production of high quality product.

v. It minimize waiting times and transportation costs.

3. How does the JIT approach help in improving an organisation's profitability? (May'07)
Answer: JIT approach helps in the reduction of costs/increase in prices as follows:

i. Immediate detection of defective goods being manufactured so that early correction is ensured with least scrapping.
ii. Eliminates/ reduces WIP between machines within working cell.
iii. OH costs in the form of rentals for inventory, insurance, maintenance costs etc. are reduced.
iv. Higher product quality ensured by the JIT approach leads to higher premium in the selling price.
v. Detection of problem areas due to better production/scrap reporting/labour tracing and inventory accuracy lead to reduction in costs by improvement.

Materials Requirement Planning (MRP) system
Materials requirements planning (MRP) is a "push-through" system that manufactures finished goods for inventory on the basis of demand forecasts.
MRP uses:

i. demand forecasts for the final products;

ii. a bill of materials outlining the materials, components, and subassemblies for each final product and ;

iii. the quantities of materials, components , finished products, and product inventories to predetermine the necessary outputs at each stage of production.

Taking into account the lead time required to purchase materials and to manufacture components and finished product, a master production scheduled specific the quantity and timing of each item to be produced. Once schedule production states, the output of each departments is pushed

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through the production line whether it is needed or not. The result is often an accumulation of inventory at workstations that receive work they are not yet ready to process.

4. State the requirements for operation of a Materials Requirement Planning (MRP) system. (Nov'10)

Answer: Requirements for operation of a MRP system

i. **Master production schedule :** It specifies the quantity of each finished unit of products to be produced along with the time at which each unit will be required.

ii. **Bill of materials file :** This file specifies the sub-assemblies, components and materials requirement for each item of finished goods.

iii. **Inventory file :** It maintains details of items in hand for each sub-assemblies, components and materials required.

iv. **Routing file :** This file specifies the sequence of operations required to manufacture components sub-materials required.

v. **Master parts file :** It contains information about the production time of sub-assemblies and components produced internally and lead time for externally procured items.

5 Explain the pre-requisites for successful operation of material requirement planning. (May'11)

Answer: Pre-requisites for successful operation of MRP system are:

(i) The latest production and purchasing schedules prepared should be strictly adhered to Day to Day change from predetermined schedules will cause chaos.

(ii) Raw Materials, sub-assemblies and components required for production should be pre-determined in quantifiable terms. Standard should be set for the consumption quantity, quality, mix and yield of raw materials for every unit of finished product.

(iii) Work-force must be appraised of the system and the need for absolute adherence to the schedules prepared.

(iv) Necessary internal control system should be developed to ensure total adherence to the schedule.

(v) Accuracy of the data supplied is vital to the MRP system.

Objectives of MRP :

- It determines the quantity and timing of finished goods demanded.
- It determines time phased requirements of the demand for materials, components and sub assemblies over a specified planning time horizon.
- It computes the inventories, work – in – progress batch sizes and manufacturing and packing lead times.
- It controls inventory by ordering components and materials in relation to orders revived rather than ordering them from stock level point of view.

MRP- II

MRPII (also written MRP-2) adds the MRP schedule into a capacity planning system and then builds the information into a production schedule. It is also seen as a link between strategic planning and manufacturing control.

The sequence of events is as follows :

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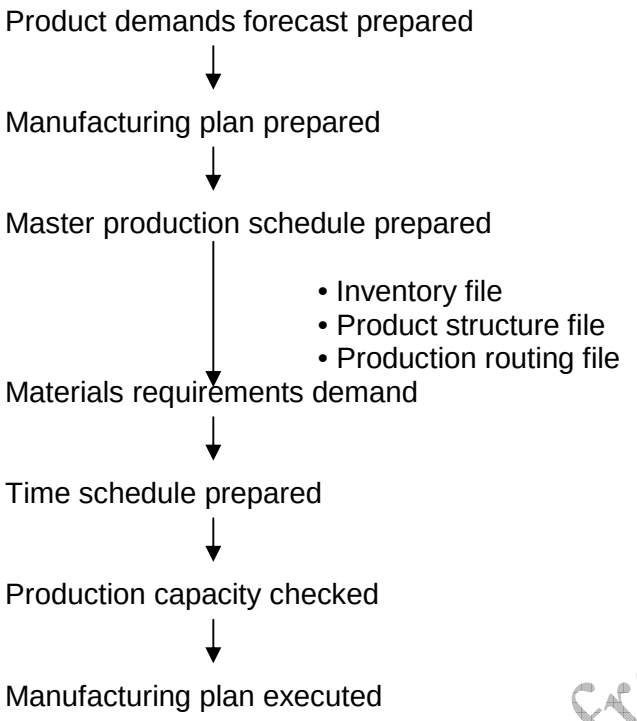

From that document, a manufacturing, plan is developed based upon inputs from purchasing & production. Adjustments may be necessary to allow for production rates. Possible inventory levels in seasonal trades & the size of the workforce. The manufacturing plan leads into a detailed master production schedule which is akin to the original philosophy of MRP already outlined.

If correctly applied, MRPII provides a common data base for the different function units such as manufacturing, purchasing and finance within a firm.

ENTERPRISE RESOURCE PLANNING (ERP) (Nov'06)

Enterprise Resource Planning (ERP) is the latest high-end solution which information technology has lent to business application. The ERP solution seek to streamline and integrate operation process and information flows in the company to synergies the resources of an organisation namely men, material, money and machine though information.

Enterprise resource planning software or ERP attempts to integrate all departments and functions across a company into a single computer system that can serve all those different departments particular needs. In fact ERP combines all computerised departments together with the help of a single integrate software program that runs off a single database so that various department can more easily share information and communicate with each other.

The need for ERP:

Most organisation across the world have realised that in a rapidly changing environment, it is impossible to creates and maintain customer designed software package which will cater to all their requirements and be up-to-date. Realising the requirement of user organisations, some of the leading software companies have designed Enterprise Resource Planning software, which offers an integrated software solution to all the function of an organisation.

Components of ERP :

To enable the easy handling of the system, ERP has been divided the following core subsystems, sales and marketing, master scheduling, materials requirements planning, capacity requirement

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planning, bill of materials, purchasing, shop floor control, accounts payable/receivable , logistic, assets management and financial accounting.

Features of ERP (Nov'07)

- ERP facilities company—wide Integrated Information System covering all functional areas like manufacturing, selling and distribution, payables, receivables, inventory, accounts, human resources, purchases etc.
- ERP perform core activities and increases customers service, thereby augmenting the corporate image.
- ERP bridge the information gap across organisations.
- ERP provides complete integration of system not only across departments but also across companies under the same management ;
- ERP is the solution for better project management.
- ERP allows automatic introduction of the latest technologies like Electronic Fund Transfer (EFT). Electronic Data Interchange (EDI), Internet, Intranet, Video conferencing, E—commerce etc.
- ERP eliminates most business problems like materials shortages, productivity enhancements, customer service, cash management, inventory problems, quality problems, prompt delivery etc.
- ERP not only addresses the current requirement of the company but also provide the opportunity of continually improving and refining business Processes.
- ERP provides business intelligence tools like Decision Support Systems (DSS), Executive Information System (EIS), Reporting. Data Mining and Early warning systems (Robots) for enabling people to make better decisions and thus improve their business processes.

Benefits of ERP (Nov'06)

i. **Product Costing :** Determination of cost of products correctly, is quite critical every industry. ERP supports advances costing methods, including standard costing, actual costing and activity–based costing. Additionally, all costing methods and information can be fully integrated with finance.

ii. **Inventory Management :** ERP can be used in multi-national, multi – company, and multi— site manufacturing and distribution environments. This system simplifies complicated logistics by allowing one to plan and manage companies in different countries as a single unit and its advanced functionality allows one to process product and financial information flows in several different ways. Inventory reporting supports all reporting of specific & general types of stock transaction such as various types of stock transfers, re-classification, ID changes & physical inventory results.

iii. **Distribution & Delivery:** Flexibly & efficiently to deliver the right product from the right warehouse to the right customer at the right time. To the customer, the most important element is quality of one-time delivery. It doesn't matter how well a product is made if arrives late. It requires application of automatic or manual load planning, transportation planning for in-house vehicles or third party agents, EDI support for transport booking, confirmation & dispatch.

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iv. **E – Commerce :** Internet enables ERP to act efficiently (Case Study : Wal-Mart) ,

v. **Automatic Control :** It ensure automatic quality control procedure.

vi. **Sales Service :** It ensures better after sales service.

vii. **Improvement in Production Planning :** It improved production planning.

viii. **Quick response:** It enables quick response to change in business operations & market conditions.

ix. **Cumulative Edge's:** It helps to achieve competitive advantages by improving business process.

Reasons for implementation of ERP

i. **Improve a company business performance :** ERP automates the tasks involved in performance a business process – such as order fulfillment which involves taking an order from a customer, shipping it and billing for it. With ERP, When a customer service representative takes an order from a customer, he or she has all the information necessary to complete the. Everyone else in the company sees the same computer screen and has access to the single database that holds the customer's new order. When one departments finishes with the order is at automatically routed via the ERP system to the next department.

ii. **Standardize manufacturing processes :** Manufacturing companies --- especially those with an appetite for mergers and acquisitions --- often find that multiple business units across the company make the same widget using different methods and computer systems, Standardizing those processes and using a single, integrated computer system can save time, increase productivity & reduce headcount.

iii. **Integrate Financial data:** As the CEO tries to understand the company's overall performance, he or she may find many different versions of the truth. Finance has its own set of revenue numbers, sales has another version, & the different business units may each have their own versions of how much they contributed to revenues. ERP creates a single version of the truth that can't be questioned because everyone is using the same system.

iv. **To standardise HR information :** Especially in companies with multiple business units, HR may not have a unified, simple method for tracking employee time and communicating with them about benefits and services. ERP can fix that.

6. What is Back flushing in a JIT system? State the problems that must be addressed for the effective functioning of the system? (June 09, May'10)

Answer: Traditional accounting system records the flow of inventory through elaborate accounting procedures. Such systems are required in those manufacturing environment where inventory/ WIP values are large. However, since JIT systems operate in modern manufacturing environment characterized by low inventory and WIP values, usually also associated with low cost variances, the requirements of such elaborate accounting procedures does not exist.

Back flushing requires no data entry of any kind until a finished product is competed. At that time the total amount finished is entered into the computer system which is multiplied by all by all components as per the bill of materials (BOM) for each item produced. This yields a lengthy list of components that should have been used in the production process and this is subtracted from the opening stock to arrive at the closing stock to arrive at the closing stock/ inventory.

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The problems with back flushing that must be corrected before it works properly are:

i. The total production quantity entered into the system must be absolutely correct, if not, then wrong components and quantities will be subtracted from the stock (Production Reporting).

ii. Abnormal scrap must be diligently tracked and recorded. Otherwise materials will fall outside the back flushing system and will not be charged to inventory (Scrap reporting).

iii. Lot tracing is impossible under the back flushing system. This is required when a manufacturer needs to keep records of which production lots were used to create a product is case all the items in a lot need be recalled (Scrap reporting).

iv. The inventory balance may be too high at all times because the back flushing transaction that relieves inventory usually does so only once a day, during which time other inventory is sent to the production process. This makes it difficult to maintain an accurate set of inventory records in the warehouse (inventory accuracy).

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Pricing & Pareto Analysis

Pricing is primarily the top management's exercise in Profit Planning by Profit center. The necessity for pricing decision may arise when

- a new product is to be placed in the market (Penetration or skimming),
- market cannot be penetrated at existing price or there is customers' resistance to the existing price,
- quotations or bids are to be made for the products or offers are received for purchase at a specific price, and
- some products are yielding profits lower than expected.
- for inter departmental transfer

The basic four parameters of pricing are

1. Nature of product
2. Market condition
3. Strategies of competitors
4. Government Policies

1. What is Pareto Analysis? Name some applications. (May'08, Nov'11)
Answer: Pareto analysis is based on the 80:20 rule that was a phenomenon observed by Vilfredo Pareto. According to him 80% of wealth of Milan in Italy was owned by 20% of its citizens. The phenomenon can be observed in many different business situations & the management can follow it in various circumstances to direct management attention to the key control mechanism or planning aspects.

Analysing and focusing on the 80% value relating to 20% volume helps business in the following areas.

(i) Pricing of a product (in a multi-product company)
(ii) Customer profitability.
(iii) Stock control.
(iv) Activity Based Costing (20% cost drivers are responsible for 80% of total cost)
(v) Quality Control.

2. Explain the usefulness of Pareto analysis and the applicability to business situations. (Nov'08)
Answer: Pareto analysis is based on the 80:20 rule that was a phenomenon observed by Vilfredo Pareto. According to him 80% of wealth of Milan in Italy was owned by 20% of its citizens. The phenomenon can be observed in many different business situations & the management can follow it in various circumstances to direct management attention to the key control mechanism or planning aspects.

Usefulness of Pareto analysis: It helps to establish top priorities & to identify both profitable and unprofitable targets it helps to:

- Prioritize problems, goals and objectives
- Identify root causes
- Select and define key quality improvement programs
- Select key customer relations and service programs
- Select key employee relations improvement programs
- Select and define key performance improvement programs
- Maximize research and product development time
- Verify operating procedures and manufacturing processes

25 Marks Theory surely come from this material

- Product or services sales and distribution
- Allocate physical, financial and human resources.

Applicability of Pareto analysis to business situations: The Pareto analysis is generally applicable to the following business situation.

i. **Pricing of a product:** In practice, it has been observed that 20% of products of a firm may account for 80% of total sales revenue. Under such circumstances the firm can adopt more sophisticated pricing method for small portion of products that jointly accounts for approximately 80% of total sales revenue. For the remaining 80% of the products the firm may use cost bases pricing method.

   Pareto analysis thus helps the management of the firm to delegate the pricing decision for about 80% of its products to lower levels of management.

ii. **Customer profitability:** Customers can also be analyzed instead of products, for their relative profitability It has been often found that 20% of customers may generate 80% of sales revenue profit. Such an analysis is useful for the evaluation of portfolio of customer profile.

iii. **Stock control:** Approximately 20% of the total investment in quantity of stock may account for about 80% of its investment. Since the number of items is small therefore the management of a firm may be able to control most of the monetary investment in them.

iv. **Applicability in activity based costing:** In ABC it is often said that 20% of an organisation cost drivers are responsible for 80% of the total overhead cost. By analyzing, monitoring and controlling those cost drivers that cause most cost a better control and understanding of overheads may be obtained.

v. **Quality control:** Pareto analysis seeks to discover from an analysis of defect report or customer complaints which "vital few" causes are responsible for most of the reported problems. Often 80% of underlying problems can usual be traced to 20% of the various underlying causes.

3. Discuss briefly the concept of Skimming Pricing Policy. (Nov'08, Nov'09)

Answer: It is a policy of high price during the early period of a product's existence. This can be synchronized with high promotional expenditure and in the later years the prices can be gradually reduced. The reasons for following such a policy are :

i. The demand is likely to be inelastic in the earlier stages till the product till the product is established in the market.

ii. The charging of high price in the initial periods, serves to skim the cream of the market that is relatively insensitive to price. The gradual reduction in price in the later year will tend to increase the sales.

iii. This method is preferred in the beginning because in the initial periods when the demand for the product is not know the price covers in initial cost of production.

iv. High initial capital outlays, needed for manufacture, result in high cost of production. Added to this, the manufacturer has to incur huge promotional activities resulting in increased costs. High initial prices will be able to finance the cost of production particularly when uncertainties block the usual sources of capital.

For example: Electronic goods, mobile phone, Flat, TVs, etc

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4. What is penetrating pricing ? In what circumstances can penetration pricing policy be adopted? (June 09, Nov'08, May'01, May'10)

Answers : This pricing policy is in favour of using a low price as the principal instrument for penetrating mass markets early. It is opposite to skimming pricing. The low pricing policy is introduced for the sake of long-term survival and profitability and hence it has to receive careful consideration before implementation. It needs an analysis of the scope for market expansion and hence considerable amount of research and forecasting are necessary before determining the price.

Penetration pricing means a price suitable for penetrating mass market as quickly as possible through lower price offers. This method is also used for pricing a new product. In order to popularize a new product penetrating pricing policy is used initially. The company may not earn profit by resorting to this policy during the initial stage. Later on, the price may be increased as and when the demand picks up. Penetrating pricing policy can also be adopted at any stage of the product life cycle for products whose market is approached with low initial price. The use of this policy by the existing concerns will discourage the new concerns to enter the market. This pricing policy is also known as "stay-out-pricing".

Circumstances for adoption:

i. When the demand of the product is elastic to price, In other words, the demand of the product increases when price is low.

ii. When there are substantial saving on large-scale production. Here increase in demand is sustained by the adoption of low pricing policy.

iii. When there is threat of competition. The prices fixed at a low level act as an entry barrier to prospective competitors.

iv. The short run price elasticity of demand is high. By charging a low price, the first entrant is able to establish a market.

v. Exploitation of established reputation / sales, marketing, distribution strengths. Create platform form for continued sale of related products.

For example, entry of a new model small segment car into the market

5. Outline the features of penetration pricing strategy. (Nov'06)

Answer:

i. it is a policy of using a low price as the principal instrument for penetrating mass markets early.

ii. This method is used for pricing a new product and to popularize it initially.

iii. Profits may not be earned in the initial stages. However, prices may be increased as and when the product is established and its demand picks up.

iv. The low price policy is introduced for the sake of long term survival and profitability and hence it has to receive careful consideration before implementation. It needs an analysis of the scope for market expansion and hence considerable amount of research and forecasting are necessary before determining the price.

6. Explain different types of Competitive pricing? (Nov'04)

Answer: Where a company sets its price mainly on the consideration of what its competitors are charging, its pricing under such situation is called competitive pricing. Two types of competitive pricing are:

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i. **Going rate pricing –** Under this method, the firm tries to keep its price at the average level charged by the industry. Such pricing is useful where it is difficult to measure costs. Adoption of such pricing will not only yield fair return but would be least disruptive for industry's harmony. Under highly competitive conditions in homogenous product market (such as food; raw materials and textiles) the company has no pricing decision to make.

ii. **Sealed bid pricing –** competitive pricing is adopted in situations where firms compete for jobs on the basis of bids. The bid is the firms offer price, and it is a prime example of pricing based on the expectations of how competitors will price rather than on a rigid relation based on the concerns own costs or demand. The objective of the firm in bidding situation is to get the contract and therefore it tries to set its prices lower than the other bidding firms.

7. State the general guidelines to be used in adopting a pricing policy in a manufacturing organization. (Nov'08)

Answer: The general guidelines to be used in adopting a pricing policy are as under:

i. The pricing policy should encourage optimum utilization of resources.

ii. The pricing policy should work towards a better balance between demand and supply.

iii. The pricing policy should promote exports.

iv. The pricing policy should serve as an incentive to the manufacturers to maximize production by adopting improved technology.

The pricing policy should avoid adverse effects on the rest of the economy.

8. Is it justifiable to sell at a price below marginal cost at any time? Mention the circumstances in which it is justifiable. (May'08, May'00)

Answer: It is justifiable to sell at a price below marginal cost for a limited period. The circumstances may be:

i. Where materials are of perishable nature.

ii. Where stocks have been accumulated in large quantities and the market prices have fallen. This will save the carrying cost of stocks, e.g., electronic goods –market prices fall due to quick obsolescence or advanced technological replenishment.

iii. It is essential to reduce the prices to such an extent in order to popularize a new product.

iv. Where such reduction enables the firm to boost the sales of other products having larger profit margin.

v. To capture foreign markets

vi. To obviate shut down costs

vii. To retain future market

9. How Pareto analysis is helpful in pricing of product in the case of firm dealing with multi-products? (Nov'05)

Answer: In the case of firm dealing with products, it would not be possible for it to analyze price-volume relationship for all of them. Pareto Analysis is used for analyzing the firm's estimated sales revenue from various products and it might indicate that approximately 80% of its total sales revenue is earned from about 20% of its products. Such analysis helps the top management to

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delegate the pricing decision for approximately 80% of its product to the lower level of management, thus freeing them to concentrate on the pricing decisions for products approximately 20% of which is essential for the company's survival. Thus, a firm can adopt more sophisticated pricing methods for small proportion of products that jointly account for 80% of total sales revenue. For the remaining 80% products, which account for 20% of the total sales value the firm may use cost based pricing method.

10. What do you mean by Loss Leader ?

Answer: Where a product can be enriched by a series of optional extras, which a customers of the main product are at liberty to add on for additional advantages, the main product may be offered at a relatively low price. If the price is set below cost, the product becomes a 'loss leader'. It leads the customers to buy the extras or optional advantageous spare parts which are highly price.

When a product range consists of one or more main products and a series of related optional 'extract', which the customer can 'add on' to the main product, the supplier can set a relatively low price for the main product and a high one for the 'extras'. Obviously, the aim is to stimulate sufficient demand for the former to ensure the target return from sales of the latter. The strategy has been used successfully by aircraft engine, gas turbine manufacturers, who win an order with a very competitively priced main product that can only be serviced by their own, highly priced spare parts.

Gillette did not invent the safety razor but the market strategy Gillette adopted helped to build market share. Gillette razors were sold at 1/5 of the cost to manufacture them but only Gillette blades fitted and these were sold at a price of 5 cents. The blades cost only 1 cent to manufacture and so Gillette made large profits once it had captured the customer.

11. State the important factors to be considered in pricing decision ?

Answer : Decision on product pricing is influenced by many considerations. Some of the factors are within the control of the decision-making while others as are not so.
Thus price setting may be based on different considerations such as :

Cost plus a mark-up

1. Profit quantum on selling price
2. Return on investment

There is no unique method that will be the optimum under all situations.

Cost plus markup method in general is not advisable as :

a. the determination of the cost of a product (particularly in the case of multi product firm) is difficult and any cost figure derived is subject to errors of estimation and some arbitrariness.
b. since all costs are recovered in the price set, inefficiencies in operations lead to increased cost are passed into the price. Thus there is no incentive for improvement.

Price set on cost plus ignore the market conditions, and competitiveness profit quantum of selling price has the following limitations :

i. Selling price may have to be varied to suit markets and hence price and profit quantum will be subject to variations.
ii. The profit quantum is difficult to be assessed particularly in case of multiple products.
iii. The overall profit may not be adequate to provide adequate return ion investment

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Market penetration :A company may deliberately fix a low price with a view to capture a dominant share of the market. While so fixing prices as low as possible, the company will build up capacity to produce a high volume so that when the demand increases to give them large market share, it will be able to satisfy the demand by producing more and thus it derives the benefit of higher volume of production reducing the cost per unit. The following conditions are favourable for such a pricing policy —

i. the market is highly price sensitive :
ii. the unit cost of production and distribution decreases with the increase of sales volume.
iii. The low price will discourage competitors including potential ones, who could otherwise enter the market.

Market skimming : Some companies take advantage of the fact that certain buyers are ready to pay a higher price than others, since it has high value to them because of their immediate need. In order to tap these high rates of revenues such companies fix fewer units are sold.

The following conditions are favorable for such a pricing policy —

i. there are sufficient number of potential buyers having a high current demand;
ii. the high price will not attract more competitors; and
iii. the high price gives the impression that the product is of superior quality.

12. What is meant by Cost-plus pricing ? What are its advantages and disadvantages? (May 2000)
Answer : It is the most widely used method of pricing a product as it ensures that the selling price is greater than the total cost of a product. This method helps business firms to generate profits and survive in the future.

Under cost plus pricing the selling price of the product is determined by adding a percentage of mark-up to the estimated unit cost of the product.

The unit cost of the product can be determined by using different methods viz., total cost; manufacturing cost or variable/incremental cost. The percentage of mark-up to be added to estimated cost also vary and depends upon the cost figure used. For example, if total cost is used, the mark up will be added to provide an acceptable profit per unit.

Alternatively if total manufacturing cost is used, the 'plus' that is added must be sufficient to cover non-manufacturing overheads and to provide an acceptable profit per unit.

During the world wars, the concept of cost plus pricing became very much prevalent, as most of the defence contracts were priced at full cost plus a pre-agreed quantum of profit.

In cost plus pricing, the capacity utilisation of the concern has an important bearing and unless the same is considered on a realistic basis the determination of cost would get vitiated.

At present, in Government sometimes Tariff Commission, Bureau of Industrial Cost & Prices (BICP) are required to fix prices of certain products and services. They mainly adopt a system of cost plus pricing. Similarly, government has also set up a separate agency to fix prices for pharmaceutical products.

The advantages and disadvantages of cost plus pricing are as under:

Advantages:

i. It is a fair method and recovery of full costs is assured under it.
ii. It leaves out scope for any uncertainty.

25 Marks Theory surely come from this material

iii. After arriving at full cost, the profit percentage can be flexibly adjusted to take care of market competition.

Disadvantages:

i. Covering full cost all the time may ignore the competition.
ii. It can lead to a distorted price fixation unless the cost is determined in a scientific manner.
iii. It ignores the concepts of Marginal Costing, Incremental Costing etc.
iv. It is difficult to predetermine capacity utilization.

13. Enumerate the circumstances which are favourable for the adoption of a penetrating pricing policy (May 1999)

Answer: Penetrating pricing Policy: It means a pricing policy for penetrating mass market as quickly as possible through lower price offers. This method is also used for pricing a new product. In order to popularise a new product penetrating pricing policy is used initially. The company may not earn profit by resorting to this policy during the initial stage. Later on, the price may be increased as and when the demand picks up. Penetrating pricing policy can also be adopted at any stage of the product life cycle for products whose market is approached with low initial price. The use of this policy by the existing concerns will discourage the new concerns to enter the market. The pricing policy is also known as "stay-out-pricing".

Favourable Circumstances: The three circumstances favourable for resorting to penetrating pricing policy are as under:

i. When demand of the product is elastic to price. In other words, the demand of the product increases when price is low.

ii. When there are substantial savings on large scale production. Here increase in demand is sustained by the adoption of low pricing policy.

iii. When there is threat of competition, the prices fixed at a low level will act as an entry barrier to the prospective competitors.

14. Describe two pricing practices in which non-cost reasons are important, when setting prices (Nov'00)

Answer: Two pricing practices in which non-cost reasons are important when setting price are:

(i) Price discrimination and (ii) Peak load pricing.

i. **Price discrimination:** This is the practice of charging to some customers a higher price than that charged to other customers e.g. Airlines tickets for business travellers and LTC travellers are priced differently.

ii. **Peak load pricing:** This pricing system is based on capacity constraints. Under this pricing system a higher price for the same service or product is demanded when it approaches physical capacity limits e.g. telephones, tele-communication, hotel, car rental and electric utility industries are charged higher price at their peak load.

15. What is Price Discrimination ? Under what circumstances it is possible ? (May'10)

Answer: Price discrimination is charging different prices with respect to customers, products, places and time. It is possible when

- the market being capable of being segmented
- the customers is not able to resell the product at a higher price
- The competitors underselling is not possible

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Target Costing

Target costing originated in Japan in the 1960s, where it is know as Genka Kikaku. It is such a costing system where the management consider it as a profit planning system.

Target costing is an activity which is aimed at reducing the life-cycle costs of new products, while ensuring quality & customer requirements, by examine all possible ideas for cost reduction at the product planning, research and development, and the prototyping phases of production.

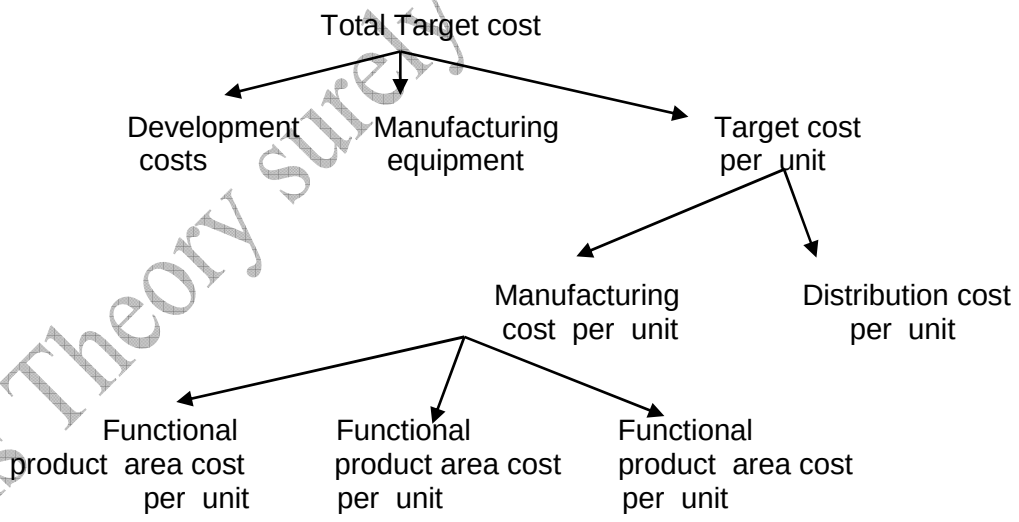
Using target cost in the concept and design stages

Target costing is an iterative process that cannot be de-coupled from design. The pre-production stages can be categorized in a variety of different ways in the detailed discussion below five different stages are used and the different activities are now listed.

1. **Planning :** Once the concept has been developed a planned sales volume and selling price, which depend on each other, will be set, as well as the required profit discussed earlier. From this the necessary target cost (or allowable cost as it is often know) can be ascertained.

   Target cost = Planned selling price -- Required profit

2. **Concept design :** The basic product is designed. The total target cost is split up. Firstly an allowance for development costs and manufacturing equipment costs are deducted from the total. The remainder is then split up into units costs that will cover manufacturing and distribution etc. The manufacturing target cost per unit is assigned to the function areas of the new product. The breakdown of target cost



3. **Basic design :** The components are designed in details so that they do not exceeds the functional target costs. Value engineering is used to get the costs down to the target. If one function cannot meet its target, the targets for the others must be reduced or the product redesigned.

4. **Details design:** The detailed specifications and costs estimates are set down from the basic design stage.

5. **Manufacturing preparation :** The manufacturing process, including new machines and jigs, etc. is designed in keeping with the target cost. Standard for the materials and labour

25 Marks Theory surely come from this material

hours that should be used are set. These value are presented to the staff in the factory immediately they are set so that approval can be given.

Target costing for existing products

Cost control is not forgotten once the product goes into production. Manufacturing performance is measured to see if the target is being achieved. The reason for doing this are:

1. to see who is responsible for any cost excess and to offer them help, and
2. to judge whether the cost planning activities were effective.

If after three months the target cost is missed by a large margin an improvement team is organised which will conduct a through value analysis (VA) and will stay in existence for about six months.

Target costing support system

It should be clear that target cannot operate in isolation; support systems are needed to feed it information. Kato (1993)listed the support systems needed in order to operated target costing successfully. They are as follows.

1. **Sales pricing support systems :** These are market research system, which have the following qualities :
   - An ability to decompose product function into sub-function and supply information on that basis.
   - Facilities to convert the value placed on each function into price.
   - A value-price conversion table or database.
   - A market research toolbox with various forecasting techniques.
   - Simulation function (what-if, sensitivity analysis, etc.)
2. **Target profit computation support systems**
   - Support mechanisms for strategy formulation, profit planning, human resource management and capital investment decision making.
   - Product portfolio planning systems, which can calculate the optimal product mix in the future.
   - Profit decomposition systems for each product.
3. **Research and development support systems**
   - Computer graphics, computer aided design (CAD), computer aided engineering (CAE), etc.
   - Project management system to monitor and aid R&D activities based on expert systems or artificial intelligence (AL).
4. **Research system for infusing target costs into products**.
   - Value engineering (VE) – in Japan these are based on cost tables reduction databases. (Cost tables are widely used in Japan and agencies exist to provide relevant data to different industries. The tables are extremely important and help accurate cost predictions and allow for a series of 'what if' question to be asked.)
   - Variety reduction.

25 Marks Theory surely come from this material

PROBLEMS WITH TARGET COSTING :

Though the target costing system results in clear, substantial benefits in most cases, it has a few problems that one should be aware of and guard against. These problem are as follows :

The first problem is that the development process can be lengthened to a considerable extent since the design team may require a number of design iterations before it can devise a sufficiently low-cost product that meets the target cost and margin criteria. This occurrence is most common when the project manager is unwilling to "pull the plug" on a design project that cannot meet its costing goals within a reasonable time frame. Usually, if there is no evidence of rapid progress toward a specific target cost within a relatively short period of time, it is better to either ditch a project or at least shelve it for a short time and then try again, on the assumption that new cost reduction methods or less expensive materials will be available in the near future that will make the target cost an achievable one.

Another problem with target costing is that a large amount of mandatory cost cutting can result in finger-pointing in various parts of the company, especially if employees in one area feel they are being called on to provide a disproportionately large part of the savings. For example, the industrial engineering staff will not be happy if it is required to completely alter the production layout in order to generate cost savings, while the purchase staff is not required to make any cost reductions through supplier negotiations. Avoiding this problem requires strong interpersonal and negotiation skills on the part of the project manager.

Finally, having representatives from number of departments on the design team can sometimes make it more difficult to reach a consensus on the proper design because there are too many opinions regarding design issues. This is a major problem when there are particularly stubborn people on the design team who are holding out for specific product features. Resolving out is difficult and requires a strong team manager, as well as a longterm commitment on the part of a company to weed out those who are not willing to act in the best interests of the team.

1. Discuss, how target costing may assist a company in controlling costs and pricing of products. (Nov'08)

Answer: Target costing may assist control of costs and pricing of product as under:

i. Target costing considers the price that ought to be charged by a company to achieve a given market share.

ii. Target costing should take life cycle costs in to consideration.

iii. If there is a gap between the target cost and expected cost, ways and means of reducing or eliminating it can be explored.

iv. The target cost may be used for controlling costs by comparison.

2. What is Target Costing? It is said that implementation of the target costing technique requires intensive marketing research. Explain why intensive marketing research is required to implement target costing technique. (Nov'07)

Answer: Target cost is the difference between estimated selling price of a proposed product with specified functionality and quality and the target margin. This is a cost management technique that aims to produce and sell products that will ensure the target margin. It is an integral part of the product design. While designing the product, the company needs to understand what value target customers will assign to different attributes and different aspects of quality. This requires use of techniques like value engineering and value analysis. Intensive marketing research is required to understand customer preferences and the value they assign to each attribute and quality parameter. This insight is required to be developed must before the product is introduced.

25 Marks Theory surely come from this material

The company plays within the space between the maximum attributes and quality that the company can offer and the minimum acceptable to target customers. Therefore in absence of intensive marketing research, the target costing technique cannot be used effectively.

3. What are the advantages / benefits of Target Costing ? (May'10)
Answer:

i. It reinforces top-to-bottom commitment to process and product innovation, and is aimed at identifying issues to be resolved, in order to achieve some competitive advantage.

ii. It helps to create a company's competitive future with market-driven management for designing and manufacturing products that meet the price required for market success.

iii. It uses management control systems to support and reinforce manufacturing strategies; and to identify market opportunities that can be converted into real savings to achieve the best value rather than simply the lowest cost.

iv. Management Control System focuses on cost reduction with value addition.

v. It helps to retain or increase market share by aligning the product with customer needs.

vi. It promotes team spirit.

4. What is Target Costing and what are the stages to the methodology ? (Nov 2000)
Answer:

Target Costing: It is a management tool used for reducing a product cost over its entire life cycle. It is driven by external Market factors. Marketing management prior to designing and introducing a new product determines a target market price. This target price is set at a level that will permit the company to achieve a desired market share and sales volume. A desired profit margin is then deducted to determine the target maximum allowable product cost. Target costing also develops methods for achieving those targets and means to test the cost effectiveness of different cost-cutting scenarios.

Stages to the methodology:

i. **Conception (planning) Phase:** Under this stage of life cycle, competitors products are to be analysed, with regard to price, quality, service and support, delivery and technology. The features which consumers would like to have like consumer value etc. established. After preliminary testing, the company may be asked to pinpoint a market niche, it believes, is under supplied and which might have some competitive advantage.

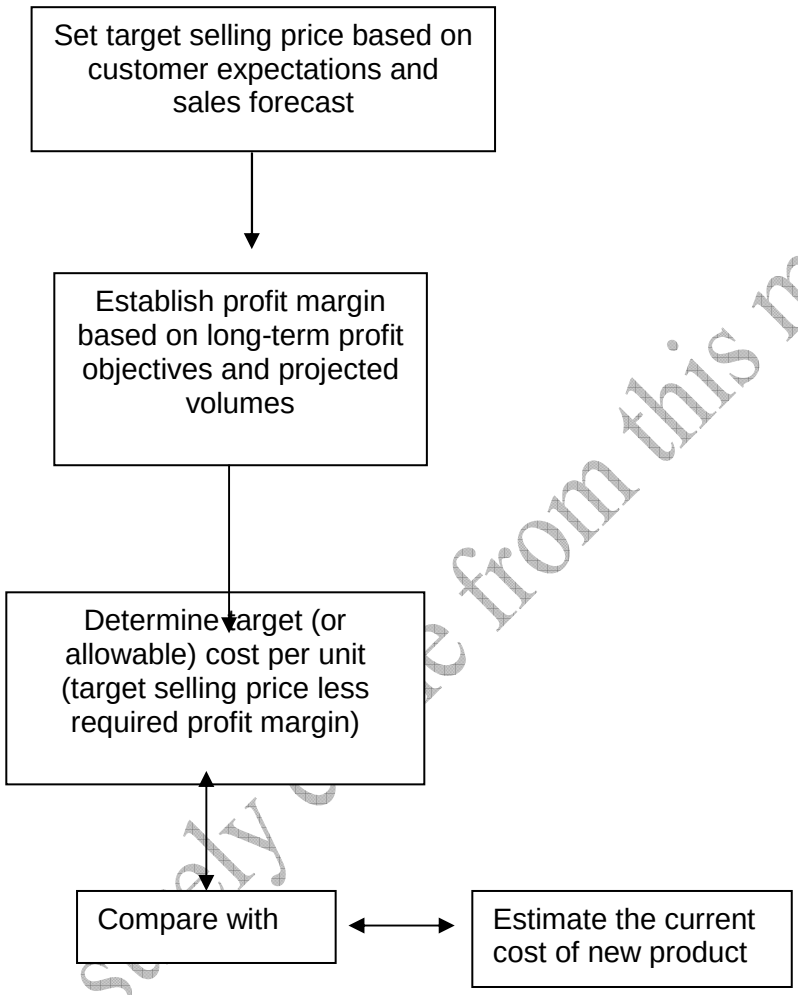
ii. **Development phase:** The design department should select the most competitive product in the market and study in detail the requirement of material, manufacturing process along with competitors cost structure. The firm should also develop estimates of internal cost structure based on internal cost of similar products being produced by the company. If possible the company should develop both the cost structures (competitors and own) in terms of cost drivers for better analysis and cost reduction.

iii. **Production phase:** This phase concentrates its search for better and less expensive products, cost benefit analysis in different features of a product priority wise, more towards less expensive means of production, as well as production techniques etc.

25 Marks Theory surely come from this material

5. List the steps involved in target costing process with the help of a block diagram. (Nov'06)

Answer: **Target Costing Process**



A brief explanation of the steps involved in target costing approach to pricing is as follows:

1. Setting of target selling price: The setting of target selling price of product which the customers are prepared to pay, depends on many factors like: design specifications of the product, competitive condition, customers' demand for increased functionality and higher quality projected production volume, sales forecasts etc. A concern can set its target selling price after taking into account all of the aforesaid factors..

2. Determination of target cost: Target profit margin may be established after taking into account long-term profit objectives and projected volumes of sales. On deducting target profit margin from selling price, target cost is determined.

3. Estimate the actual cost of the product: Actual cost of the product may be determined after taking into account the design specifications, material cost and other costs required to produce the product.

4. Comparison of estimated actual cost with target cost: In case the estimated cost of the product is higher than that of the target cost of the product then the concern should resort to cost reduction methods involving the use value engineering/value analysis tools.

25 Marks Theory Study Circle from this material

Total Quality Management (TQM)

TQM is composed of three paradigms:
Total = Quality involves everyone and all activities in the company.
Quality = Conformance to Requirements (Meeting Customer Requirements)
Management = Quality can and must be managed.

TQM may be defined as the continous improvement in quality, productivity & effectiveness obtained by establishing responsibility for process as well as output. TQM is a philosophy & a movement rather than a body of technique. There are many alternative models & definitions of TQM.

1. Definition of Quality: (Check carefully how the definitions changes from Seller's market to Buyer's market)
Answer:

i. The **first definition** given was quality is conforming to specifications. Generally the specifications are set by the producers.

ii. The **second definition** given for quality was fitness for use. A product which is usable and conforms to all the specifications given, will generally be a good product. But a good product, which is not saleable, will not be appreciated. To sell a product it is necessary to incorporate customers, viewpoint. A customer will buy a product only if the cost, reliability, aesthetics, etc. suit his conditions. Hence customer focus has to be given prime importance and even in defining the quality, customer focus has to be stressed.

iii. The **third definition** given for quality was customer satisfaction. A product, which satisfies the customer, will have a great market. The customer will also be happy that the product of his choice is being given to him. A person will be satisfied if all his needs are fulfilled.
The following factors are the commonly expressed "satisfaction" of the Customer:

(i)	Utility value	(ii)	Affordable cost
(iii)	Longer life	(iv)	Reliable performance
(v)	Product look	(vi)	Ease of maintenance
(vii)	Prompt after sales service, etc.		

iv. The **fourth definition** given to quality was delighting the Customer. Delightment is one step ahead of satisfaction. A delighted customer is definitely in a different, better planed as compared to a satisfied customer. When the product fulfils both the expressed and unexpressed, i.e., explicit and implicit needs of the customers, he is delighted. The industries decided that they should work towards delighting the customer by providing them the products which will fulfill both their expressed and unexpressed needs. Such a status will ensure good business and help in producing quality goods.

Three core concepts of TQM:

i. **Quality Control (QC):** It is concerned with the past, and deals with data obtained from previous production, which allows action to be taken to stop the production of defective units.
ii. **Quality Assurance (QA):** It deals with the present, and concerns the putting in place of system to prevent defects from occurring.
iii. **Quality Management (QM):** It is concerned with the future, and manages people in the process of continuous improvement to the products and services offered by the organization.

25 Marks Theory surely come from this material

2. Quality as a competitive weapon

Many companies throughout the world e.g. Hewlett–Packard & Ford Motor Co. British Telecom & Toyota; & Samsung in Korea–view total quality management is providing an important competitive edge, because a quality focus reduce costs & increase customer satisfaction.

International quality standards have emerged. e.g. ISO: 9000, developed by the International Organisation for Standardization, is set of five international standards for quality management adopted by more than 115 countries. ISO 9000 was created to enable companies of effectively document and certify their quality system elements.

To ensure that their supplier deliver high-quality products at competitive costs, some companies such as DuPont and General Electric, are requiring their suppliers to obtain ISO 9000 certification. Thus, certification and an emphasis on quality are rapidly becoming conditions for competing in the global marketplace.

Although quality refers to wide variety of factors ---such as fitness for use, customer satisfaction, and the degree to which a product conforms to design specification and engineering requirements but the focus is on two basis aspects of quality :

Quality of design: It refer to how closely the characteristic of a product or service meets the needs and wants of customers. Suppose customers of photocopying machines want copies that combine copying, fixing, scanning and electronic printing. Photocopying machines that fail to meet these customer needs fail in the quality of their design.

Conformance quality: It refer to the performance of a product or service relative to its design and product specifications. For example, if a photocopying machine mishandles paper or breaks down, it fails to satisfy, conformance quality. Product not conforming to specification must be required, reworked, or scrapped at an additional cost to the organisation. If nonconformance errors remain after the product is shipped and the product breaks down at the customer site, even greater repairs costs as well as the loss of customer goodwill (often the highest quality cost of all) may result.

3. Six Sigma (6□)

Continuous improvement can be brought in to the organizational culture by introducing continuously changing, planned targets. One such target can be six sigma accuracy. The Sigma accuracy means the process is 99.999998% accurate. That is the process will/can produce only 0.002 defects per million. This is the structural meaning of six sigma. However in quality practice 6σ means 3.4 parts per million (PPM).

Six sigma is a statistical measure used to ensure quality of products and services. The six sigma academy has developed a break through strategy consisting of measure, analyze, improve and control, that allows companies to make exceptional bottom-line improvements. In addition to the material and labour savings, which flow directly to the bottom line, a company engaged in six sigma can expect to see:

- Improved customer satisfaction
- Reduction cycle time
- Increased productivity
- Reduction in total defect
- Improved process flow

4. How does Total Quality Management(TQM) facilitate value addition in an organisation?

OR

What are the essential requirements for successful implementation of TQM? (May'07)

25 Marks Theory surely come from this material

Answer: Total quality Management (TQM) is defined as a set of concepts and Tools for getting all employees focused on continuous improvements in the eyes of the customer. Since TQM focuses the attention of an organisation on quality, thus it helps to provide the customer with much higher quality prudent expenditure on cost of preventing errors can often lead to large reduction in cost of failure and consequently lead to reduce the total cost. The organisations constantly strive for improvement so that more and more value can be added through improved quality of product at lower cost.

5. Various Stages / Steps to be taken in the implementation of TQM:

Stage 1: Identification of customer/customer groups: A team approach was adopted (a technique called as multi-voting technique) to generate priorities in the identification of customers and critical issues in the provision of decision-support information. A multi-voting technique was employed to priortise the list of customers and provide a focus of services. The ranking or perceived customer importance reveals the priority customers for management accounting services as :

1. manager;
2. engineers; and
3. leading hands.

Stage 2 : Identifying customer expectations: Once the major customer groups are identified, their expectations are listed. The question to be answered is - **What does the customer expect from us ?**

Stage 3 : Identifying customer 's decision-making requirements and product utilities: Where the focus is on quality improvement, the overriding need is to stay close to the customers and follow their suggestions . In this way, a decision -support system can be developed , incorporating both financial and non-financial information, which provides a flexible reporting system meeting user requirements.

In order to do this properly, we need to know :

i. the nature of the decisions being made;
ii. the nature of the decision-making process; and
iii. the degree to which information requirements are being met.

A survey of users is required to provide this information, but critical issues can be identified and prioritised in advance, in order to refine the necessary survey questions.

Stage 4 : Identifying perceived problems in the decision-making process and product utilities: Using participative processes such as brainstorming and multi-voting, the team ranked the characteristics of an accounting information system thought most desireable from a decision-making point of view, as follows :

1. Relevance. A targeted decision-making process.
2. Congruence. Consistency with the long-term strategy of the business.
3. Comprehensibility. Systems should be readily understandable and, therefore, readily usable, by customers.
4. Linkage to non-financial indicators. Systems need to reflect the monetary impact of physical parameters.
5. Timelines. Systems should be on-time and on-line.

These characteristics were perceived as being areas of weakness where the greatest impact could be achieved through the implementation of improvements. It is instructive to consider some of the actual situtations that might be associated with improvements in these areas.

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Stage 5 : Comparision with other organisations and benchmarking: Detailed and systematic internal deliberatios allow the accounting team/firm to develop a clear idea of their own strengths and weaknesses and of the areas of most significant deficiency. The benchmarking exercise allows the firm to see how other similar companies are coping with similar problems and opportunities.

Stage 6: Customer feedback: Stage 1 to 5 provide an information base developed without reference to the key player the customer. This is rectified at stage 6 with a survey of representative customers which embraces their views on perceived problem areas. Interaction with the customers are obtaining their views, helps the firm in correcting its own perceptions and refining its processes.

Stage 7 & 8 :The Identification of improvement opportunity and implementation of Quality Improvement Process: The outcomes of the customer survey, benchmarking and internal analysis, provides the raw material for stage 7 and 8 of the review process : the identification of improvement opportunities and the implementation of a formal improvement process.
This is done through a six-step process called 'PRAISE' in short.

Difficulties experienced at each step in the PRAISE process:

(i) At step 1, the symptoms or observed effects of a problem may be readily apparent, but it may be more difficult to identify a measurable improvement opportunity. Attempts to identify problems broadly as 'communication', 'organisation', 'morale' or 'productivity' should be resisted - much more specific target areas are required to allow a focus on precisely what is wrong.

(ii) It may not be possible to achieve consensus at step 2 because of the pet projects of a minority of the team members. Multi-voting may therefore be necessary to provide a focus in a democratic manner.

(iii) Lateral thinking may be helpful at step 3 to encourage a wide-ranging discussion and to avoid a blinkered approach to the nature of the problem. The required objective is the identification of the root cause and this is unlikely to be one that promotes a quick-fix solution.

(iv) 'Innovation' and 'creativity' are the keywords at step 4 to encourage a multitude of suggested solutions. These may then be evaluated in terms of the extent to which they may be converted into operating plans which achieve the required objectives. A systematic evaluation of positive and negative aspects of each strategy is essential - but remember, no matter how sophisticated the analysis, the final solution is only as good as the original list from which it is chosen.

(v) The implementation of the solution at step 5 may require a great deal of diplomacy, especially in divisions or departments resistant to change. Possible side-effects must be identified and the whole process smoothed through with the co-operation of the workforce at all levels, efficient internal communication, training programmes where appropriate, and feedback throughout.

(vi) The evaluation at step 6 may indicate the trouble-free implementation of a strategy which has solved 100 per cent of the problem. More likely it will not! As part of the drive for continuous improvement in quality, several other areas capable of improvement will emerge. As such, step 6 is not the last stage in the process but the first stage in a renewed process. The new problems emerging here provide fresh improvement opportunities ready for restatement at step 1 and prioritisation at step 2.

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(vii) Central to the whole PRAISE system are both quality control - the search for continuous improvements in quality - and total employee involvement - the co-operation and commitment of employees. This dual approach provides a single focus - the customer whose increased satisfaction remains the primary goal of the procedure.

6. "PRAISE Analysis" OR "Remedies available for difficulties experienced in each step available during implementation of PRAISE" (Nov'10)

The identification of improvement opportunities and implementation of quality improvement processes (Stage 7 and Stage 8) of the TQM process is through a six – step activity sequence identified by the acronym 'PRAISE'.

Step	Activity	Elements
1	Problem identification	• Areas of customer dissatification • Absence of competitive advantage • Complacency regarding present arrangements
2	Ranking	Prioritise problems and opportunities by • perceived importance, and • ease of measurement and solution
3	Analysis	• Ask 'Why ?' to identify possible causes Keep asking 'Why ?' to move beyond the symptoms and to avoid jumping to premature conclusions • Ask 'What ?' to consider potential implications • Ask 'How much ?' to quantify cause and effect
4	Innovation	• Use creative thinking to generate potential solutions • Operationalise these solutions by identifying barriers to implementation, available enablers, and people whole co-operation must be sought
5	Solution	• Implement the preferred solution • Take appropriate action to bring about the required changes • Reinforce with training and documentation back-up.
6	Evaluation	• Monitor the effectiveness of actions • Establish and interpret performance indicators to track progress towards objectives • Identify the potential for further improvements - and return to step 1

7. Six Cs of TQM:

Commitment: If a TQM culture is to be developed, so that quality improvement becomes a normal part of everyone's job, a clear commitment, from the top must be provided. Without this all else fails. It is not sufficient to delegate 'Quality' issues to a single person since this will not provide an environment for changing attitudes and breaking down the barriers to quality improvement. Such expectations must be made clear, together with the support and training necessary to their achievement.

Culture: Training lies at the centre of effecting a change in culture and attitudes. Management accountants, too often associate 'creativity' with 'creative accounting' and associated negative perceptions. This must be changed to encourage individual contributions and to make 'quality' a normal part of everyone's job.

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Continuous improvement: Recognition that TQM is a 'process' not a 'programme' necessitates that we are committed in the long term to the never-ending search for ways to do the job better. There will always be room for improvement, however small.

Co-operation: The application of Total Employee Involvement (TEI) principles is paramount. The on-the-job experience of all employees must be fully utilised and their involvement and co-operation sought in the development of improvement strategies and associated performance measures.

Customer focus: The needs of the customer are the major driving thrust; not just the external customer (in receipt of the final product or service) but the internal customer's (colleagues who receive and supply goods, services or information). Perfect service with zero defects in all that is acceptable at either internal or external levels. Too frequently, in practice, TQM implementations focus entirely on the external customer to the exclusion of internal relationships; they will not survive in the short term unless they foster the mutual respect necessary to preserve morale and employee participation.

Control: Documentation, procedures and awareness of current best practice are essential if TQM implantation are to function appropriately. The need for control mechanisms is frequently overlooked, in practice, in the euphoria of customer service and employee empowerment. Unless procedures are in place improvements cannot be monitored and measured nor deficiencies corrected. Difficulties will undoubtedly be experienced in the implementation of quality improvement and it is worthwhile expending procedure that might be adopted to minimize them in detail.

8. Quality Circle Philosophy

Quality Circle is a group activity, practiced at regular intervals, which focuses on quality practices. By quality practice, it is meant teamwork, two work communication between top and bottom cadres, use of scientific methods for analysis, continuous problem solving, humanitarian approach, continuous up gradation of work related knowledge and recognition for good work. Quality circle philosophy incorporates all the aforesaid factors. Hence it is recommended that the quality circle be introduced in the organisation for building the quality culture.

9. Cost of quality

To compete successfully in today's global competitive environment companies are becoming 'customer-driven' and making customer satisfaction an overriding priority. Customers are demanding ever-improving levels of service regarding:

a. cost, b. quality,
c. reliability, d. delivery and
e. the choice of innovative new products.

Cost of quality is often viewed as the cost of non-conformance of the product to set specifications. This helps the management of focus on target of reducing total cost related to the quality of the product or service.

Usually cost of non-conformance is classified into

1. Cost of prevention. 2. Cost of appraisal
3. Cost of internal failure 4. Cost of external failure.

Cost of prevention :--

- Cost of engineering / technical studies for improved production processes.
- Cost of equipments to produce products to specified quality standards.
- Costs of obtaining improved raw materials and suppliers training.

25 Marks theory surely come from this material

- Costs associated with training of operators.
- Costs of preventive maintenance programme.
- Apply OHSM

Cost of appraisal :

- Costs of inspecting raw materials and purchased parts.
- Costs of inspection of finished products and segregating defectives.
- Costs of quality audits.
- Costs of field tests.

Cost of internal failure : They include costs incurred before the product is dispatched to the customer

- Costs of manufacturing losses (scrap, re-work, upgrade).
- Costs of production capacity (downtime).
- Costs of interference in production schedule.
- Costs of technicians' time spent in fault investigation.
- Costs of discounts on sales of sub-standard products.

Cost of external failure :--

- Costs associated with distribution of inferior quality products to customers.
- Cost of handling customer complaints.
- Cost of customer 'displeasure'.
- Costs of claims, warranty, and replacement.
- Freight on and repairs to returned goods.
- Warranty replacement,
- Repairs of returned products
- costs arising from a damaged company reputation., loss of image and prestige of the firm.

Increase in the cost of prevention reduce cost of appraisal, internal failure, and external failure. Similarly, increases in cost of appraisal reduce the cost of internal failure, and external failure. Therefore, all these cost should be viewed together rather than in isolation.

10. Critical success factors of TQM : (Nov'09)

- The focus should be one customer needs.
- Everyone within the organization should be involve in TQM.
- The focus should be on continuous improvement.
- The aim should be to design and produce quality products.
- Introduce an effective performance measurement system that measures continuous improvements from the customer's perspective.
- Existing rewards and performance measurements should be renewed to encourage quality improvements.
- Appropriate training and education should be given so that everyone is aware of the aims of TQM.

11. Describe the types of bench marking of critical success factors. (Nov'08)

Answer: The Benchmarking is of following types:

i. **Competitive benchmarking:** It involves the comparison of competitors products, processes and business results with own.

ii. **Strategic benchmarking:** It is similar to the process benchmarking in nature but differs in its scope and depth.

25 Marks Theory surely come from this material

iii. **Global benchmarking:** It is a benchmarking through which distinction in international culture, business processes and trade practices across companies are bridged and their ramification for business process improvement are understood and utilized.

iv. **Process benchmarking:** It involves the comparison of an organisation critical business processes and operations against best practice organization that performs similar work or deliver similar services.

v. **Functional Benchmarking or Generic Benchmarking:** This type of benchmarking is used when organisations look to benchmark with partners drawn from different business sectors or areas of activity to find ways of improving similar functions or work processes.

vi. **Internal Benchmarking:** It involves seeking partners from within the same organization, for example, from business units located in different areas.

vii. **External Benchmarking:** It involves seeking help of outside organizations that are known to be best in class. External benchmarking provides opportunities of learning from those who are at the leading edge, although it must be remembered that not every best practice solution can be transferred to others.

12. Explain four P's of quality improvement principles. (Nov'09)
Answer: The Four P's quality improvement principles are as below:

People: It will quickly become apparent that some individuals are not ideally suited to the participatory process of TQM. This will be inferred from lack of enthusiasm, non – attendance of TQM meetings, failure to complete delegated work, etc. To avoid misdirection, TQM teams should consist of team spirited individuals who have a flair of accepting and meeting challenges.

Process: It is essential to approach problem solving practically and regard the formal process as a system designed to prevent participants from jumping to conclusions. As such it will provide a means to facilitate the generation of alternatives while ensuring the important discussion stages are not omitted.

Problem: Problems need to be approached in a bite – sized chunks, with team tackling solvable problems with a direct economic impact, allowing for immediate feedback together with recognition of contribution made by individual participants.

Preparation: Additional courses on creative thinking and statistical processes are needed in order to give participants a greater appreciation of the diversity of the process.

A three-point action plan for the choice of projects and the implementation of the process is as follows :

Bite-sized chunks: It is tempting to seek a large cherry to pluck, but big improvement opportunities are inevitably complex and require extensive inter-departmental co-operation. The choice of a relatively small problem in the first instance provides a greater chance of success.

A solvable problem: The problem selected should not be trivial, but it should be one with a potential impact and a clear improvement opportunity. Measurable progress towards implementation should be accomplished within three or four months (or less if possible) in order to maintain the motivation of participants and advertise the success of the improvement process itself.

25 Marks Theory surely come from this material

Recognition of participants: The successful projects and team members should receive appropriate recognition throughout the enterprise, at the very least being 'mentioned in despatches' via company newsletters. Prominent individuals should be rewarded for their efforts both as personal recognition and as encouragement to others. The precise nature of the reward may be recognition itself, although in some situations material, but usually nonmonetary, prizes may also be appropriate.

The implementation of TQM processes can provide long-lasting benefits as long as the achievement of quality goals is not in conflict with other objectives. This might be the case, where, for instance.

- bonuses are based on the volume of output alone; or
- retrenchments result from the increased efficiency associated with the quality improvement process.

By overcoming the initial obstacles, a TQM process can provide us with an additional tool to improve competitiveness and ensure long-term survival.

13. Discuss the benefits accruing from the implementation of a Total Quality Management programme in an organization. (Nov'08)

Answer: The benefits accruing from the implementation of a Total Quality Management programme in an organization are:

i. There will be increased awareness of quality culture in the organization.
ii. It will lead to commitment to continuous improvement.
iii. It will focus on customer satisfaction.
iv. A greater emphasis on team work will be achieved.

14. Responsibility accounting:

It refers to a control system of management accounting and reporting. The basis of Responsibility Accounting is the creation/recognition of various responsibility/decision centres in an organisation. The individual managers of these centres are made responsible for the insurance and control of costs relating to their responsibility centres.

The main feature of responsibility accounting is that it is more concerned with control of costs than their determination. The system would trace costs (revenues, assets and liabilities) to the individual managers who are primarily responsible for making decisions about the costs under review. In other words, the executive in charge of every responsibility centre would have authority to incur costs relating to his responsibility centre and accountable to them. If he does not have the authority to incur costs he will also not be responsible for their control.

The performance of the managers of the various responsibility centres is judged by assessing how far they have been able to monitor those costs which were under their control. This is done by furnishing the department heads with performance reports from time to time. These reports will exclude all apportioned and policy costs not subject to their control. Thus responsibility accounting is based on the principle that an executive will be held accountable only for those acts over which he has control.

Responsibility Accounting system can be tailored according to the needs of an organisation. An effective system of responsibility accounting would require that the require that the responsibility of each executive is clearly defined. He should know, what he is required to do and what performance is expected of him.

Pre-requisites for responsibility accounting:

i. The area and authority of each responsibility centre should be clearly defined.

25 Marks Theory surely come from this material

ii. The goal should be clearly stated to each manager.
iii. The performance report of a responsibility centre should include only the revenues, expenses, profit and investments which are to be controller by the executive of that centre.
iv. The items which may require management's attention like variance should be highlighted in the performance report for each responsibility centre.
v. The help of managers of responsibility centre may be sought while establishing the goals of the centre.

Classification of responsibility centers

Cost Centre : The smallest unit of an organisation. A cost center manager is responsible for the costs incurred there & can charge this cost at the time of transferring to other responsibility centre. Cost Centre are of two types – production & service. A Cost Centre cannot charge overhead on the basis of absorption costing & profit.

Profit Centre : A production / Service unit of an organisation headed by an individual fully responsible for all costs, revenues and profitability of its operations is known as a profit centre. The individual is authorised to plan and look after production, financial and accounting activities of the centre. A concern may be divided into a number of profit centre. Generally a department is considered as a profit centre if its total production is demanded by the outsiders. Hence a profit centre is empowered to charge the sales price for an inter-division transfer. A Profit Centre cannot distribute its profit without the consent of Investment Centre.

Revenue Centre: A sales center , e.g. a show room

Investment Centre : A centre whose managers are normally accountable for sales revenue and expenses but in addition they are also responsible for some capital investment decisions and are thus able to influence the size of the investment. Return on investment (ROI) and Residual Income (RI) are usually used to evaluate the performance of investment centres.

Merit of profit centre

i. It makes its managers responsible for the profit performance – achieving the budgeted amount of profit during a period.

ii. Under profit centre concept the whole organisation is dividend into a number of divisions, the performance of each division is measured in terms of both the income and the costs.

iii. Managers in each division have freedom in making decisions. They need not obtain approval from corporate headquarters for every expenditure.

Disadvantages of profit centres:

i. Division may compete with each other and may take decisions to increase profits at the expenses of other divisions thereby overemphasizing short term results.

ii. It may adversely affect co-operation between the divisions and lead to lack of harmony in achieving organisational goals of the company. Thus it is hard to achieve the objective of goal congruence.

iii. It may lead to reduction in the company's overall total profits.

iv. There may be higher cost of common activities following decentralized structure than for centralised structure. It may thus result in duplication of staff activities.

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v. Top management loses control by delegating decision marking to divisional managers. There are risks of mistakes committed by the divisional managers which the top management may avoid.

vi. Series of control reports prepared for several departments may not be effective form the point of view of top management.

vii. It may under utilise corporate competence.

viii. It leads to complication associated with transfer pricing problems.

ix. It becomes difficult to identify and define precisely suitable profit centres.

x. It confuses division's result with manager's performance.

15. Indicate the possible disadvantages of treating divisions as profit centres.
Answer:
The possible disadvantages of treating divisions as profit centres are as follows :

a) Division may compete with each other and may take decisions to increase profits at the expenses of other divisions thereby overemphasizing short term results.

b) It may adversely affect co-operation between the divisions and lead to lack of harmony in achieving organisational goals of the company. Thus it is hard to achieve the objective of goal congruence.

c) It may lead to reduction in the company's overall total profits.

d) The cost of activities which are common to all divisions may be greater for decentralized structure than for centralised structure. It may thus result in duplication of staff activities.

e) Series of control reports prepared for several departments may not be effective form the point of view of top management.

f) It may under utilise corporate competence.

g) It leads to complication associated with transfer pricing problems.

h) It becomes difficult to identify and define precisely suitable profit centres.

i) It confuses division's result with manager's performance.

16. Classify the following items under appropriate categories of quality costs viz. Prevention Costs, Appraisal Costs, Internal Failure Costs and External Failure Costs. (Nov'11)
Answer:

a)	Rework	:	Internal Failure
b)	Disposal of Scrap	:	Internal Failure
c)	Warranty Repairs	:	External Failure
d)	Revenue Loss	:	External Failure
e)	Repair to manufacturing equipment	:	Prevention Cost
f)	Discount on defective sale	:	External Failure
g)	Raw material inspection	:	Prevention Cost
h)	Finished product inspection	:	Appraisal Cost
i)	Establishment of quality circles	:	Prevention Cost
j)	Packaging inpection	:	Appraisal Cost

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Transfer Pricing

1. What are some goals of a 'transfer-pricing' system in an organisation. (May'06)
Answer: The goals of transfer pricing are that it should:

a) Provide information that motivates divisional managers to take good economic decisions which will improve the divisional profits and ultimately the profits of the company as a whole.

b) Provide information which will be useful for evaluating the divisional performance.

c) Seek to achieve goal congruence.

d) Ensure that divisional autonomy is not undermined.

Qs. Enumerate the main objectives & limitation of Transfer Pricing.
Answer: Main objective of transfer pricing are;

a) To foster commercial attitude among executives who are responsible for the performance of profit centres.

b) To optimise the profit of the concern over a short period.

c) To optimise the allocation of the concern's financial resources.

d) There may be certain division that have spare capacity. Such divisions should be motivated to utilise their balance capacity in the optimal manner.

2. Briefly describe the different methods of Transfer Pricing. (Nov'05)
Answer: The methods of pricing usually employed in industry when goods or services are transferred from one unit to the other can be broadly classified under the following three categories. Various:-

i. At cost or variants of cost e.g., actual manufacturing cost; standard cost; full cost and full cost plus mark up
ii. At market price
iii. At bargained or negotiated prices.

Pricing at cost :

a) Actual manufacturing cost: According to this method goods or services are transferred at their actual cost of production. It is a simple and useful method for units where responsibility of profit performance is centralised.

b) Standard cost: Transfers of goods and services takes place at their standard cost. Variances if arise are usually absorbed by the supplying unit but sometimes they may be transferred to the user unit as well.

c) Full Cost: It means the sum total of expenses viz., cost of production, selling and distribution, administration, research and development which is used as a transfer price. The use of this method does not permit the internal unit to earn profit by transferring goods and services internally, but permits them to do so while dealing with outsiders.

d) Full Cost plus: The supplying unit transfers goods and services at full cost plus (some mark-up). The mark-up added to full cost is either expressed as a percentage of full cost or

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of capital employed. Selling expenses here are recovered by the supplying unit without incurring them, specially when the good/services are transferred internally. Due to this defect the use of this method is not appreciated by the internal receiving units.

Market price method :

Under this method the transfer prices of goods/services transferred to other units/divisions are based on market prices. In a competitive market goods/services cannot be transferred to its users at a higher price. Such a competitive market provides an incentive to efficient production. The main limitations of this method are :

i. Difficulty in obtaining just market prices.

ii. Difficulty in determining the elements of selling and distribution expenses such as commission, discounts, advertisement and sales promotion etc., so that necessary adjustment may be maid in the market price to provide benefit of these expenses to the profit centre, receiving the goods.

Bargained/Negotiated prices method :

Each decentralised unit is treated as an independent unit and such units decide the transfer price by bargaining or negotiations. Divisional managers have full freedom to purchase their requirement from outside if the price quoted by their sister unit are not acceptable to them. A system of negotiated price develops business like attitude amongst divisions of the company. The buying division may be tempted to purchase from outside sources if the outside prices are lower than the internal division's price. In order to avoid any reduction in overall profits of the company, the top management may impose restrictions on the external purchase / sale of goods.

Limitation of negotiated method of transfer pricing

i. A system of negotiated prices develops business like attitude amongst divisions of a company. This attitude may tempt the managers to purchase their requirements from outside sources, even by, ignoring the overall interest of the company.

ii. Agreed transfer price between divisions of a company, will depend on the negotiating skills and bargaining power of the managers involved and the final outcome may not he close to optimal level.

iii. Conflict between divisions of a company may arise while negotiating about transfer price and the resolution of such conflicts may require sufficient management time.

iv. Measurement of divisional profitability may depend on the negotiating skills of the managers who have unequal bargaining power.

v. Deciding about negotiated transfer price between the divisions of a company, is time consuming exercise for the managers involved.

Dual Pricing

The dual pricing methods uses two prices. The supplying division is credited with a price based on total cost plus a mark- up and the receiving division is debited with marginal cost. This means that the selling division is allowed to earn a profit and the receiving division has the correct information in order to make the correct selling decision to maximize the group's profit. The difference between the two prices will be debited to a group account- a transfer price adjustment account. At the end of the year the profits of the two divisions, and hence of the group, will be overstated to the extent of the price difference. In order to correct this the total amount in the transfer price adjustment account must be subtracted from the two profits to arrive at the correct profit for the group as a whole.

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Two- part tariff pricing

With the system all transfers are made at marginal cost but the supplying division charges the receiving division a fixed fee for the privilege of obtaining the transfers at such a low price. The fixed fee should cover the supplying division's fixed costs and allow it to earn an adequate profit. This system also has a number of drawbacks, two of which are as follows: The supplying division has no incentive to supply units swiftly, as each unit does not generate a profit. The profit is made whenever the fixed fee is transferred.

Main objective

- To foster commercial attitude among executives who are responsible for the performance of profit centers.
- To optimise the profit of the concern over a short period.
- To optimise the allocation of the concern's financial resources.

3. Write a note on International Transfer Price.

Answer : From a financial management standpoint, one of the distinguishing characteristics of the multinational Corporation (MNC) is its ability to move money and profits among its affiliated companies through internal transfer mechanisms. These mechanisms include transfer prices on goods and services trade internally, inter-company loans, dividend payment, leading (speeding up) and lagging (slowing down) inter-company payments, and fee and royalty charges.

Transfer pricing is a device used by MNC s to price inter- corporate exchange of goods, services, technology, and capital in a manner designed to maximise overall after-tax profit. These products and factor flows range from intermediate and finished goods to less tangible items such as management skills, trademark, and patents.

Apart from tax- saving, transfer pricing may be used to serve one or more of the following objectives:

i) Positioning of founds in locations that will suit corporate working capital policies.
ii) Reducing exchange exposure and circumventing exchange controls, restrictions on profit repatriation so that transfers from affiliates to the parent can be maximised.
iii) Reducing customs duty payments and overcoming quota restrictions on imports.
iv) " Window dressing" operations to improve the apparent, i.e. reported financial position of an officiate so that its credit rating may be enhanced.

Of course, some governments have passed legislation to discourage MNC s from tax avoidance scheme through the manipulation of transfer prices.

4. In transfer pricing what is common conflict between a division and the company as a whole.

Answer: Usually conflict between a division of the company and the company as a whole is faced by the management of decentralised units when products or services are exchanged among different divisions of the company. Such a conflict becomes more significant in the case of those concerns where profitability is used as a criteria for evaluating the performance of each division.

The essence of decentralisation is reflected in the freedom to make decisions. Under such a set up it is expected that the top management should not interfere with the decision making process of its subordinates heading different units. In other words , management of decentralised units is given autonomy with regard to decision making. In this system top management is expected to preserve 'autonomy in decision making'. The management of such companies also expects that each division should not only achieve its own objective necessary for evaluating the performance but should also achieve the objective of goal congruence.

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A divisional head in a company under aforesaid set up is free to use a price as a transfer price for goods and services, which may provide incentive. Such a transfer price may fail to achieve the objective of 'Goal congruence' (which means a perfect congruence between division's goal and the goal of the company). In case of failure of a division to achieve the objective of 'goal congruence' the management of the company may dictate their 'transfer price'. Such a interference of management of the company is usually the main basis of conflict between a division and the company as a whole.

Further this conflict is aggravated if the management advocates the transfer of goods and service at cost. As such the transfer price will not reflect a good picture about the performance of the transferring division. The profitability of the transferring division will not be known by the use of such a transfer price.

Each division appreciates the transfer of its goods/services at usual selling price/market price so as to arrive at the correct return/profitability figure, used for measuring the performance. There is no incentive to the transferring division if goods and services are transferred at variable cost.

5. a. "Transfer pricing is a widely debated and contested topic" – Discuss.

b. What should be the basis of transfer pricing, if unit variable cost and selling price are not constant ? (Nov'99)

Answer (a).: Usually a conflict between a division of the company and the company as a whole is faced by the management of decentralised units when products or services are exchanged among different divisions of the company. Such a conflict becomes more significant in the case of those concerns where profitability is used as a criteria for evaluating the performance of each division.

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Further this conflict is aggravated if the management advocates the transfer of goods and services at cost. As such, the transfer price will not reflect a good picture about the performance of the transferring division. The profitability of the transferring division will not be known by the use of such a transfer price.

Each division appreciates the transfer of its goods/services at usual selling price/market price so as to arrive at the correct return / profitability figure, used for measuring the performance. There is no incentive to the transferring division if goods and services are transferred at variable cost.

Answer (b): If unit variable cost and unit selling price are not constant then the main problem that would arise while fixing the transfer price of a product would be as follows :

25 Marks Theory surely come from this material

There is an optimum level of output for a firm as a whole. This is so because there is a certain level of output beyond which its net revenue will not rise. The ideal transfer price under these circumstances will be that which will motivate these managers to produce at this level of output.

Essentially, it means that some divisions in a business house might have to produce its output at a level less than its full capacity and in all such cause a transfer price may be imposed centrally.

6. What should be the basis of transfer pricing, if unit variable cost and unit selling price are not constant? (Nov 1999)

Answer:

If unit variable cost and unit selling price were not constant then the main problem that would arise while fixing the transfer price of a product would be as follows:

There is an optimum level of output for a firm as a whole. This is so because there is a certain level of output beyond which its net revenue will not rise. The ideal transfer price under these circumstances will be that which will motivate these managers to produce at this level of output. Essentially, it means that some division in a business house might have to produce its output at a level less than its full capacity and in all such cases a transfer price may be imposed centrally.

7. Discuss the potential for maximization of income by a multinational through the use of transfer pricing mechanism. (Nov'00)

Answer:

The potential for maximization of income by a multinational through the use of transfer pricing mechanism is based on the successful implementation of the following steps:

i. Transfer pricing may be set relatively higher for affiliates in relatively high-tax countries that purchase inputs from affiliates located in relatively low-tax countries.

ii. Transfer prices to affiliates in countries which are subject to import duties for goods or services purchase may be set low so as to avoid host country taxes.

iii. Transfer prices to an affiliate in a country that is encountering relatively high inflation may be set relatively high to avoid some of the adverse effects of local currency devaluation that are related to the high inflation.

iv. Transfer prices may be set high for goods and services purchased by an affiliate operating in a country that has imposed restriction on the repatriation of income to foreign companies.

v. Transfer prices may be set low for an affiliate that is trying to establish a competitive advantage over a local company either to break into a market or to establish a higher share of the company's business.

8. What will be the marketable transfer pricing procedure regarding the goods transferred under the following conditions (each condition is independent of the other)?

(i) When division are not captives of internal divisions and the divisions are free to do business both internally and externally and when there are reasonably competitive external markets for the transferred products.

(ii) If the external market for the transferred good is not reasonably competitive. (Nov'00)

Answer:

<u>Marketable Transfer Pricing Procedure</u>

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i. When division are not captives of internal divisions and the divisions are free to do business both internally and externally and when there are reasonably competitive external markets for the transferred products, then the most suitable transfer price would be, the market price, as it generally leads to optimal decisions.

ii. In case, the external market for the transferred good is not reasonable competitive, following two situations may arise in this case.

   a. If there is idle capacity: Under this situation opportunity cost will be zero hence minimum transfer price should be equal to the additional outlay costs incurred upto the point of transfer (sometimes approximated by variable costs).

   b. If there is no idle capacity: Under this situation opportunity cost should be added to outlay costs for determining minimum transfer price.

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Value Analysis

1. What is the concept of 'Value-Chain' and why is it important for cost Management. (May'06, June09)

Answer: Value chain is the linked set of value creating activities from the basic raw materials and components sources to the ultimate end use of the product or service delivered to the customer.

The six business functions contained in the value chain are (i) Research & Development; (ii) Design; (iii) Production; (iv) Marketing; (v) Distribution; and (vi) Customer service.

The objective of value chain is to serve as means of increasing the customer satisfaction and managing costs effectively. Coordination of the individual parts of the value chain activities creates conditions to improve customer satisfaction in terms of cost efficiency, quality and delivery. A firm which performs value chain activities more efficiently and at a lower cost than its competitors will be able to gain competitive advantage. The following methodology should be adopted.

i. The firm should identify the industry value chain and then assign costs, revenues and assets to value activities.

ii. Diagnose the cost drivers regulating each value activity.

Develop sustainable cost advantage either by controlling cost drivers better than competitors or by reconfiguring the chain value.

By analyzing costs, revenues and assets in each activity systematically a company can achieve low cost. Thus value chain helps managers in deciding how to apply the organization's valuable physical and human resources to each linked process so as to achieve cost effectiveness.

2. Mention three 'useful strategic frameworks of the value chain analysis. (4 Marks) (June 09)

Answer: Three useful strategic frameworks for value chain analysis are:

- Industry structure analysis;
- Core competencies; and
- Segmentation analysis.

3. Explain, how does value chain approach helps an organisation to assess its competitive advantage. (Nov'04)

Answer: Most of the firms define value chain as mission of creating product or services. For these firms, the products or services generated are more important than any single step within their value chain. These firms use the value chain approach to better understand and identify which segment, distribution channel, price point, product differentiation, selling proposition and value chain configuration will yield them the greatest competitive advantage.

The way the value chain approach helps these firms to assess competitive advantage includes the use of following steps of analysis :

(i) **Internal cost analysis -** to determine the sources of profitability and the relative cost position if internal value creating processes.

(ii) **Internal differentiation analysis –** to understand the sources of differentiation (including the cost) within internal value creating processes, and

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(iii) **Vertical linkage analysis –** to understand the relationships and associated costs among external suppliers and customer in order to maximize the value delivered to customers and to minimise cost.

These type of analysis are not mutually exclusive. In fact, firm begin by focusing on their internal operations and gradually widening their focus to consider their competitive position within their industry. The value chain approach used for assessing competitive advantage is an integral part of the strategic planning process.

4. Write a short notes on value analysis

Answer: Value analysis (also known as value engineering) is a systematic interdisciplinary examination of factors affecting the cost of a product or service in order to devise means of achieving the specified purpose at the required standard of quality and reliability at the target cost.

The aim of value engineering is to achieve the assigned target cost by

i. identifying improved product designs that reduce the product's cost without sacrificing functionality and/or

ii. eliminating unnecessary functions that increase the product's costs and for which customers are not prepared to pay extra for.

Value analysis or value engineering is one of the most widely used cost reduction techniques. It can be defined as a technique that yields value improvement.

It investigates into the economic attributes of value. It attempts to reduce cost through

- design change,
- modification of material specification,
- change in the source of supply and so on.

It emphasises on finding new ways of getting equal or better performance from a product at a lesser cost without affecting its quality, function, utility and reliability. For example, the function of a fastener is to join two or more parts. Value analysis examines the value of this function in terms of alternative methods such as welding, taping stapling, etc. in view of the stress and vibrations involved in a specific application.

In value analysis each and every product or component of a product is subjected to a critical examination so as to ascertain its utility in the product, its cost, cost benefit ratio, and better substitute etc. When the benefits are lower than the cost, advantage may be gained by giving up the activity concerned or replacing if for betterment. The best product is one that will perform satisfactorily at the lowest cost.

The various steps involved in value analysis are :

i. identification of the problem;
ii. collecting information about function, design, material, labour overhead costs, etc., of the product and finding out the availability of the competitive products in the market; and
iii. exploring and evaluating alternatives and developing them.

In other words value analysis brings out clearly the areas where the cost of a product can be reduced by pointing out :

- Unnecessary items, components in a product to be removed.
- Possibility of substitution with reduced cost without affecting its quality.
- Possibility of overall simplification in design manufacture etc. of a product.

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5. Value Engineering is more effective than any other cost reduction technique like Work Study, Automation etc. — Discuss this statement in the Indian context.

Answer: Value engineering or value analysis is one of the most widely used cost reduction technique in the purchasing and production areas. It aims at reducing cost through change, modification of material specification, change in the source of supply of material and so on. It emphasis's on finding new ways of getting equal or superior performance from a product at a minimum cost without affecting its quality, function and reliability.

It is the process of subjecting each and every component of a product to a critical examination so as to ascertain :

i. Its utility in the product;
ii. Its cost;
iii. Whether is cost commensurate with its utility ;
iv. Whether it can be replaced by a cheaper components ;
v. Whether it can be does away with ;
vi. What the competitors are using in place of it ; and
vii. Whether anybody is buying it at cheaper price.

Utility means usefulness; this can be easily and definitely measured when the concerned component or the service can be obtained form outside — the price measures it usefulness. In some cases where an outside market does not exist, utility would be measured only subjectively. Still one would have a fair idea of whether the benefit obtained, say in terms of better appearance, is worth the costs incurred.

Usually it would be profitable tom tap outside sources if the price is lower than the cost. But this decision needs to be made with great care as the question of fixed and sunk costs is very important.

Value engineering bring clearly the areas where the cost of product can be decreased by pointing out:

i. Unnecessary items/components in a which might have had once some utility but now are redundant and, therefore, dispensable ;
ii. the possibilities of component — substitution with reduced cost without affecting the quality of the product; and
iii. the possibilities of overall simplification in design / manufacture etc. of a product.

The relationship between value engineering and cost reduction

a. Value engineering is done with a view to reduce the cost and cost reduction looks upon value engineering as one of its prime tools.

b. Cost-reduction has always followed a critical examination of the benefit incurred. Value engineering is a careful and as far possible, quantities appraisal of the benefit derived at each stage of work. Where the benefits are lower than the cost, advantage may be gained by giving up the activity concerned or replacing it by something else.

c. Work study automation etc, do reduce cost but in most cases, they save only labour cost by improving efficiency, etc. On the other hand, value engineering relates the worth of the product, its value to the function it is intended to perform and makes a sizeable in the cost of the materials by design changes, substitution etc.

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6. How can value analysis achieve cost reduction? (Nov'09)
Answer:
Value analysis can do cost reduction in the following manner:

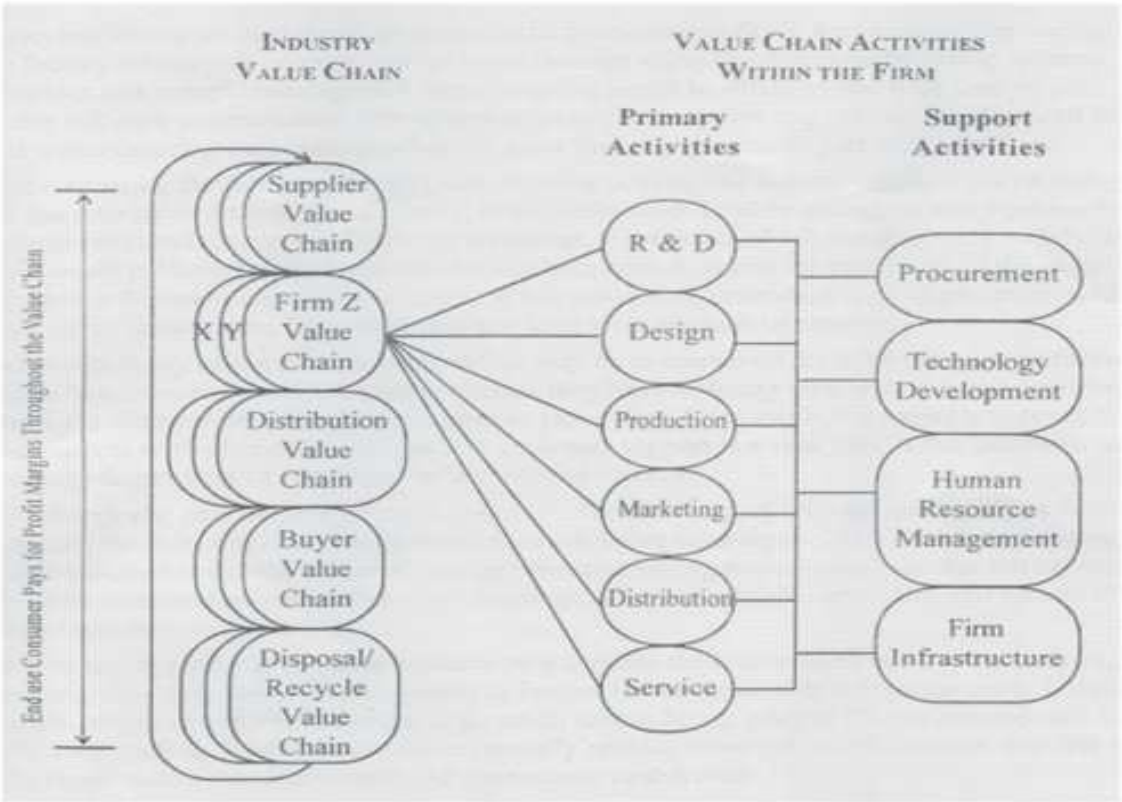
i. By identifying and removing unnecessary components in a product which had utility earlier.

ii. By introducing component substitution at a lesser cost without affecting the quality of the product.

iii. By simplifying the product design.

iv. By introducing alternative methods with less cost but improved efficiency.

7. Explain with a diagram the value chain activities within the firm with suitable classifications under primary and support activities and also the industry value chain indicating what the end use consumer pays for? (Nov'06)
Answer:



8. Differentiate between 'Traditional Management Accounting' and 'Value Chain Analysis in the strategic framework'. (Nov'08)

Answer: Traditional management accounting focuses on internal information. It often places excessive emphasis on manufacturing costs. It also assumes that cost reduction must be found in the "value-added" process i.e. selling price less the cost of raw material. The value chain analysis approach encompasses external and internal data, uses appropriate cost drivers for all major value-creating processes, exploits linkages throughout the value chain, and provides continuous monitoring of a firm's strategic competitive advantages.

Value Chain vs. Traditional Management Accounting

Traditional Management Accounting	Value Chain Analysis in the strategic framework
1. If focuses on internal information	Focuses on external informations.
2. Application of single cost driver at the overall firm level is taken.	Application of multiple cost drivers i.e. structural and executional are taken for each value activity.
3. It assume that cost reduction must be found in the value added process	Exploits linkages throughout the value chain i.e. within firm, with suppliers and customers.
4. Insights for strategic decisions somewhat limited in traditional management accounting	Identity cost driver at the individual activity level and develop cost / differentiation advantage either by controlling those drivers better than competitors by reconfiguring the value chain.

9. What is Internal Differentiation Analysis?

Answer: The value chain approach is also used by organizations to identify opportunities for creating and sustaining superior differentiation. In this situation, the primary focus is on the customer's perceived value of the productions and service

As with internal cost analysis, internal differentiation analysis requires firms to first identify their value-creating processes and primary cost drivers. They are then ready to perform a differentiation analysis using the following guidelines:

1. Identify the Customers' value-creating processes;
2. Evaluate differentiation strategies for enhancing customer value; and
3. Determine the best sustainable differentiation strategies.

10. What is Vertical linkage Analysis?

Answer: Linkages among value creating processes do not end with the activities within a firm. The greatest competitive advantage may come out of linkages between a firm's value creating activities and those of its suppliers, channels or users.

Vertical linkage analysis is a much broader application of inter cost & difference analysis that includes all upstream & downstream value creating processes throughout the industry. Vertical linkage analysis considers all links from the source of raw materials to the disposal

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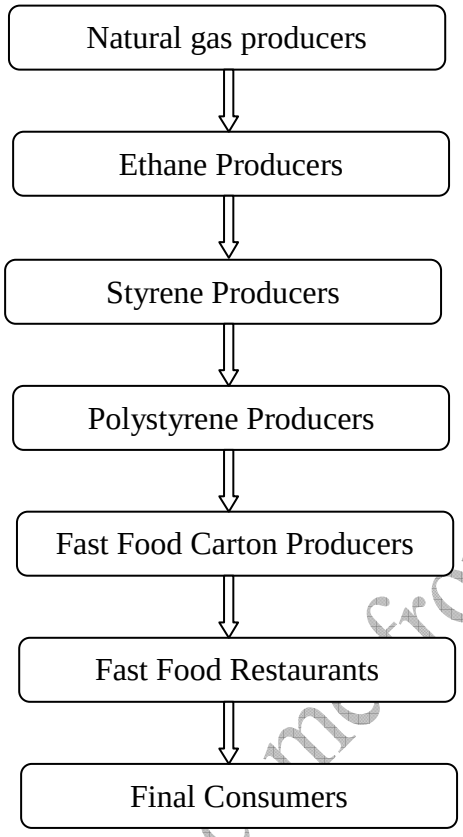
and/or recycling of the product. Exhibit outlines the vertical links involved in the production of "fast food" containers.



Vertical linkage can reveal which activities are the most (and least critical to competitive advantage (or disadvantage). For example, Swiss watchmakers succeeded for years as relatively small, labour - intensive assemblers. Then came the 1970s and the advent of low cost, mass - produced watches. The Swiss responded by restructuring their industry to gain economies of scale similar to those enjoyed by their global competitors.

11. Explain Core Competencies Analysis?

Answer: Industry structure analysis is well suited to describing the what of competitiveness, i.e., what makes one firm or one industry more profitable than another. But understanding the particulars of such advantages as low cost, quality, customer service and time to market may still leave some questions which still largely unanswered. For example, why do some companies seem able only to observe and follow?

Thus, industry structure analysis must be supplemented by an equally explicit core competence focus. Organizations need to be viewed not only as a portfolio of products or services, but also as a portfolio of core competencies.

Core competencies are created by superior integration of technological, physical and human resources. They represent distinctive skills as well as intangible, invisible, intellectual assets and cultural capacities. Cultural capabilities refer to the ability to manage change, the ability to learn and team working. Organizations should be viewed as a bundle of a few core competencies, each supported by several individual skills.

25 Marks Theory Study Circle from this material

Core competencies are the connective issue that holds together a portfolio of seemingly diverse businesses. Core competence - based diversification reduces risk and investment and increases the opportunities for transferring learning and best practice across business units.

For instance, Microsoft's only factory asset is its human imagination. This company has excelled in inventing new ways of using information technology for a wide variety of end users. In contrast, using its core competence in information processing,

12. Give the Limitations of value chain analysis?
Answer:

1. Non-availability of Data: Internal data on costs, revenues and assets used for Value Chain Analysis are derived from financial information of a single period. For long-term strategic decision-making, changes in cost structures, market prices and capital investments etc. may not be readily available.

2. Identification of Stages: Identifying stages in an industry's Value Chain is limited by the ability to locate at least one firm that participates in a specific stage. Breaking a value stage into two or more stage when an outside firm does not compete in these stages is strictly judgment.

3. Ascertainment of Costs, Revenue and Assets: Finding the Costs, Revenues and Assets for each Value Chain activity poses/ gives rise to serious difficulties. There is no scientific approach and much depends upon trial and error and experimentation methods.

4. Identification of Cost Drivers: Isolating cost Drivers for each Value-creating activity, identifying Value Chain Linkages across activities, and computing supplier and customer profit margins present serious challenges.

5. Resistance from Employees: Value Chain Analysis is not easily understandable to all employees and hence may face resistance from employees as well as managers.

25 Marks Theory surely come from this material

Uniform Costing

1. What is uniform costing? Why is it recommended? (June'09)
Answer: Uniform Costing: It is not a distinct method of costing when several undertakings start using the same costing principles or practices, they are said to be following uniform costing. Different concerns in an industry should adopt a common method of costing and apply uniformly the same principles and techniques for better cost comparison and common good and helps in mutual cost control and cost reduction. Hence, it is recommended that a uniform method of costing should be adopted by the member units of an industry.

2. Explain in brief the advantages and limitations of uniform costing .
Answer.: Uniform costing refers to the use of the same costing principles and practices by several undertakings. These undertakings may or may not be under the same management. Adherence to the same costing methods and procedures specially when there can be two or more options is the characteristic feature of a uniform system of costing.

Advantages of uniform costing :

The following are the advantages of uniform costing.

1. The management of an individual firm / unit will be saved of the botheration of developing and introducing a costing system of their own.
2. A uniform costing system for the firms in the same industry is provided for the adoption of such undertakings. Since, the system is devised by mutual consultation and after considering the difficulties and circumstances prevailing in the various undertakings, therefore it is readily adopted and successfully implemented.
3. It facilitates comparison of cost figures of various firms. Such a comparison enables the firms to identify their weak and strong points and control costs effectively and efficiently.
4. The available of cost data of other firms in the industry enables each firm to know its standing in the industry.
5. The benefits of research and development of bigger firms are made available to smaller firms at no cost.
6. This system of costing requires the introduction of a uniform wage system in all the firms in the industry. The introduction of a uniform wage system reduces labour turnover.
7. It helps trade associations in negotiating with the government in trade matters, particularly, when an industry seeks any assistance or concession from the government in matters of subsidies, exports, taxation, duties and price determination, etc.
8. Uniform costing is of great help in price fixation. Unhealthy competition is avoided between the firms in the same industry in framing policies and submitting tenders.
9. It helps the government also in regulating the prices of essential and important items such as bread, flour, sugar, cement and steel etc.

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Limitations of uniform costing :

1. Due to the differing circumstances in which firms operate, it is difficult to have uniform standards, methods and procedures of costing. This renders the adoption of uniform costing difficult.
2. Adoption of a uniform costing system requires various firms to disclose their cost and other data. Some of the firms do not like this and are thus hesitant towards the use of this costing system.
3. Small firms feels that uniform costing system is meant only for large and medium size firms and thus they cannot afford it.
4. Some feels that the use of this system of costing may lead to monopolistic tendencies resulting in artificially raised higher prices and curtailing supplies

3. State the objectives of uniform costing. (Nov'09)
Answer: The main objectives of uniform costing are as follows:

a) To facilitate the comparison of costs and performances of different units in the same industry.

b) To eliminate unhealthy competition among the different units of an industry.

c) To improve production capacity level and labour efficiency by comparing the production costs of different units with each other.

d) To provide relevant cost information/data to the Government for fixing and regulating prices of the products.

e) To bring standardization and uniformity in the operation of participating units.

f) To reduce the different types of costs.

4. What are the requisites for the installation of a uniform costing system ? (Nov'08, May'10)
Answer: Requisites for the installation of uniform costing: Essential requisites for the installation of uniform costing are as under:

a) The firm's in the industry should be willing to share / furnish relevant data or information.

b) A spirit of cooperation and mutual trust should prevail among the participating firms.

c) Mutual exchange of ideas, methods used, special achievement made, research and know how etc. should be frequent.

d) Bigger firms should take the lead towards sharing their experience and know how with the smaller firm to enable the latter to improve their performance.

e) In case of accounting methods, principles, procedure and production method uniformity must be established.

5. Uniform Cost Manual :
Answer: It is written document, which may be in the form of a booklet or bulletin, containing the principles, methods and procedures for the ascertainment and control of cost in uniform costing. It is necessary for the successful operation of uniform costing system. Such a manual provide guidelines to the participating firms to organise their cost accounting system on a uniform basis.

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The following are the salient features of a uniform cost manual.

a) It includes statement of objectives and purpose of the system, scope of the system, advantages and extent of co-operation necessary.
b) It contains the general principles of accounting, nature of coding, terminology to be followed, classification and description of accounts. This section also includes details of stock control, labour and overhead cost collection and control.
c) Essential cost data and various ratios to be computed for comparison of performance and efficiency in the operation of the participation units.
d) Mode, format and time for presenting cost data and reports to the management.
e) It provides necessary guideline about the treatment of depreciation, interest on capital wastage, scrap, by-product, etc.

6. What items are generally included in good uniform costing manual? (May, 07)
Answer: Uniform costing manual includes essential informations and instructions to implement accounting procedures.

a) Introduction: It includes objects and scope of the planning.

b) Accounting procedure and planning includes rules, and general principle to be followed.

c) Cost accounting planning includes methods of costing, relation between cost and financial accounts and methods of integration.

7. What is disinvestments strategy? Highlight the main reasons for disinvestments. (June'09)
Answer:
Divestment Strategy:
Divestment involves a strategy of selling off or shedding business operations to divert the resources, so released, for other purposes. Selling off a business segment or product division is one of the frequent forms of divestment strategy. It may also include selling off or giving up the control over subsidiary where by the wholly owned subsidiaries may be floated as independently quoted companies.

Reason for Divestment Strategy

a) In case of a firm having an opportunity to get more profitable product or segment but have resource constraint, it may selling off it's unprofitable or less profitable division and utilized the recourse so released. Cost Benefit analysis & Capita Budgeting Method are the useful tool for analyzing this type of situation.

b) In case of purchase of new business, it may be found that some of the part of the acquired business is not upto the mark. In such type of situation disposal of the unwanted part of the business is more desirable than hold it.

c) In case where any business segment or product or subsidiary is pull down the profit of the whole organization, it is better to cut down of that operation of the product or business segment.

8. Explain the meaning of "Inter – firm Comparison". Describe the requisites to be considered while installing a system of inter – firm comparison by an industry.
Answer:
Meaning of inter – firm comparison

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It is a technique of evaluating the performance, efficiency, costs and profits of firms in an industry. It consists of voluntary exchange of information / data concerning cost, price, profits, productivity and overall efficiency among firms engaged in similar type of operation for the purpose of bringing improvement in efficiency and indicating weaknesses. Such a comparison will be possible in the case of those concerns where uniform costing is an operation.

An inter – firm comparison indicates the efficiency of all important points and aspect in firm's management. It enables the management to challenge the standards which it has set for itself and to improve upon them in the light of current information gathered from more efficient units.

Requisites for installing a system of inter – firm comparison

In an industry, for installing a system of inter – firm comparison, the essential requisites are as follows :-

(i) Creation of a centre for inter – firm comparison : For collection and analysis of data received from different units in an industry, for the purpose of carrying out comparison and for dissemination of the results of study, a central body / a centre is necessary. The main functions of such a centre should include the following :

Collection of identified data and information from different units in an industry.

Dissemination of results to its members.

Undertaking research and development for common and individual benefits of its members.

Organising training programmes and publishing magazines.

(ii) Membership of Centre : For better results it is necessary that firms of different sizes in an industry should become members of the centre, entrusted with the tusk of carrying out inter – firm comparison.

(iii) Identification of data and information requirement : The type and extent of data and information required to be collected for inter – firm comparison, should be identified first . In fact, the requirement of such information depends much on the needs of management and the purpose of comparison. Generally, the following information is required to be collected :-

- Cost and cost structure
- Raw material consumption
- Stock of raw materials
- Wastages
- Labour efficiency and utilisation
- Machine utilisation
- Capital employed and return on capital
- Liquidity position
- Reserve and appropriation of profits
- Creditors and debtors
- Methods and techniques of production

(iv) Methods of collection and presentation of data / information : The centre collects identified data and information for its members, at fixed intervals by using prescribed formats. Sometime a questionnaire approach is also followed to gather necessary information. Data and

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information received from members is utilised for preparing reports. These reports present the data and information in the manner suitable to its users.

9. What are the advantages of inter-firm comparison system? Discuss
Answer:
Advantages of inter-firm comparison:

i. Such a comparison gives an overall view of the industry as a whole to its members – the present position of industry, progress made during the past and future of the industry.

ii. It helps a concern in knowing its strengths or weaknesses in relation to others so that remedial measures may be taken.

iii. It ensures an unbiased specialized reporting on particular problems of the concern.

iv. It develops cost consciousness among members of industry.

v. It helps Government in effecting price regulation.

vi. It helps to improve the quality of products manufactured and to reduce the cost of production. It is thus, advantageous to the industry as well as to the society.

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