CA FINAL

COSTING & OR

THEORY BOOK

(compiled by Jigar Thakkar)

Index Page

1. Developments in the Business Environment

Question 1
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:

- 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.
- 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.
- 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.

Question 2
What are the essential requirements for successful implementation of TQM?

Answer
Commitment: Quality improvement must be everyone's job. Clear commitment from the top management, steps necessary to provide an environment for changing attitudes and breaking down barriers to quality improvement must be provided. Support and training for this must be extended.
Culture: Proper training must be given to effect changes in culture and attitude.
Continuous Improvement: Recognition of room for improvement continually as a process, and not merely a one-off programme.
Cooperation: Must be ensured by involving employees by resorting to mutually agreeable improvement strategies and associated performance measures.

Customer Focus: Perfect service with zero defectives with satisfaction to end user whether external customer or internal customer.
Control: Documentation, procedures and awareness of current practices ensure checking deviation from the intended course of implementation.

Question 3
Discuss the benefits accruing from the implementation of a Total Quality Management programme in an organization.

Answer
The benefits accruing from the implementation of a Total Quality Management programme in an organisation 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.

Question 4
What are the critical success factors for the implementation of a "Total Quality Management" programme?

Answer
Critical success factors of TQM:

- Focus on customer needs.
- Everyone in the organisation should be involved.
- Focus on continuous improvement.
- Design quality in product and production process.
- Effective performance measurement system.
- Rewards and performance measurements should be renewed.
- Appropriate training and education to everyone to understand the aim of TQM.

Question 5
Explain four P's of quality improvement principles.

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. Lack of enthusiasm will be apparent from a generally negative approach and a tendency to have prearranged meeting which coincide with the meetings of TOM teams.
- Process: The rhetoric and inflexibility of a strict Deming approach will often have a demotivating effect on group activity.
- Problem: Experience suggests that the least successful groups are those approaching problems that are deemed to be too large provide meaningful solutions within a finite time period.

- Preparation: A training in the workings of Deming- like processes is an inadequate preparation for the efficient implementation of a quality improvement process.

Question 6

Give two examples for each of the following categories in activity based costing:
(i) Unit level activities
(ii) Batch level activities
(iii) Product level activities
(iv) Facility level activities.

Answer

Examples:

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

Question 7

"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.

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.

Question 8

What is the fundamental difference between Activity Based Costing System (ABC) and Traditional Costing System? Why more and more organisations in both the manufacturing and non-manufacturing industries are adopting ABC?

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:

- 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.
- 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.
- 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.
- The costs associated with bad decisions have increased substantially.
- Reduction in the cost of data processing has reduced the cost of tracking resources consumption to large number of activities.

2. VALUE CHAIN ANALYSIS

Question 1
What is the concept of 'Value-chain' and why is it important for Cost Management?

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 and 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.

- The firm should identify the industry value chain and then assign costs, revenues and assets to value activities.
- 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.

Question 2
How can value analysis achieve cost reduction?

Answer
Value analysis can do cost reduction in the following manner:

- By identifying and removing unnecessary components in a product which had utility earlier.
- By introducing component substitution at a lesser cost without affecting the quality of the product.
- By simplifying the product design.
- By introducing alternative methods with less cost but improved efficiency.

Question 3
Define the term 'value-chain'. Mention three 'useful strategic frameworks of the value-chain analysis.

Answer
Value chain is the linked set of value-creating activities all the way from basic raw material sources for component suppliers through to the ultimate end-use product or service delivered to the customer. Proter's described the value chain as the internal processes or activities a company performs "to design, produce, market, deliver and support its product". He further stated that "a firm's value chain and the way it performs individual activities are a reflection of its history, its strategy, its approach of implementing its strategy, and the underlying economics of the activities themselves". The business activities are classified in to primary activities and support activities. Primary activities are those activities which are involved in transforming the inputs in to outputs, delivery and after sales service. Support activities are intended to support the primary activities like for example procurement, human resources management, etc.
Three useful strategic frameworks for value chain analysis are:

- Industry structure analysis;
- Core competencies; and
- Segmentation analysis.

3. TARGET COSTING LIFE CYCLE COSTING

Question 1
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.

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. 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.

Question 2
Discuss, how target costing may assist a company in controlling costs and pricing of products.

Answer
Target costing may assist control of costs and pricing of product as under:

- Target costing considers the price that ought to be charged by a company to achieve a given market share.
- Target costing should take life cycle costs in to consideration.
- If there is a gap between the target cost and expected cost, ways and means of reducing or eliminating it can be explored.
- The target cost may be used for controlling costs by comparison.

Question 3
What is total-life-cycle costing approach? What is it important?

Answer
Total life cycle costing approach:
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.

Importance:
Product life cycle costing is important for the following reasons:

- When non-production costs like costs 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 sales service.
- 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.
- 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.

Question 4
Explain the essential features of Life-cycle costing.

Answer
Essential features of Life Cycle Costing:

Product Life Cycle costing involves:

- 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 focuses 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.

Question 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.

Required:

Meena has asked you to recommend industries and firms that would be good candidates for the article. What would you advice? Explain your recommendations.

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:

- High percentage of total life-cycle costs are incurred before production begins and revenue are earned over several years and
- 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, Ranbexy and Dabur will be good candidates for study on product life cycle costing.

4. JUST IN TIME

Question 1
How does the JIT approach help in improving an organisation's profitability?

Answer
JIT approach helps in the reduction of costs/increase in prices as follows:

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

Question 2
Explain, how the implementation of JIT approach to manufacturing can be a major source of competitive advantage.

Answer
JIT provides competitive advantage in the following ways:

- Stocks of raw materials and finished goods are eliminated, stock holding costs are avoided.
- JIT aims at elimination of non-value added activities and elimination of cost in this direction will improve competitive advantage.
- It affords flexibility to customer requirements where the company can manufacture customized products and the competitive advantage is thereby improved.
- It focuses the direction of performance based production of high quality product.
- It minimize waiting times and transportation costs.

Question 3
Differentiate between 'Traditional Management Accounting' and 'Value Chain Analysis in the strategic framework'.

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.

Question 4
Describe the Just-in-time systems.

Answer
A complete JIT system begins with production, includes deliveries to a company's production facilities, continues through the manufacturing plant and even includes the types of transactions processed by the accounting system.

- The company must ensure that it receives it supplies on time, preferably directly at the production facility that needs them. The company engineers must assist suppliers at their premises and ensure defect free supplies. Thus raw material inventory is reduced if correct quantities are delivered as per production schedules.
- Long set-up times are reduced into short ones by eliminating inefficiency. Thus the WIP is reduced and so is the number of products before defects are identified.
- A 'Kanban' card, which authorizes production of the right quantity by its feeder machine ensures 'pulling' the production process and elimination of inventory. Another method is the introduction of a working cell, which is a cluster of machines run by a single trained operator. This also identifies defects quickly and reduces maintenance costs. Both methods are used together.
- Work force is trained to be empowered to halt operations understand more about the system, product flow, different machines and thus, elaborate reporting of a past variance is eliminated.
- Suppliers may be paid based on production units adjusted for defects.

Question 5
What do you mean by back-flushing in JIT system? What are the problems that must be corrected before it will work properly?

Answer
Backflushing requires no data entry of any kind until a finished product is completed. At that time the total amount finished is entered into the computer system, which multiples it by all

the components listed in the bill of materials for each item produced. This yields a lengthy list of components that should have been used in the production process and which is subtracted from the beginning inventory balance to arrive at the amount of inventory that should now be left of hand. Back the entire production process. Given the large transaction volumes associated with JIT, this is an ideal solution to the problem.
The following problems must be corrected before it will work properly:

- Production reporting
- Scrap reporting
- Lot tracing
- Inventory accuracy.

5. Shut Down & Divestment

Question 1
What is divestment strategy? Highlight the main reasons for divestments.

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

- 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.
- 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.
- 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.

Question 2
What is disinvestments strategy? Highlight the main reasons for disinvestments.

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 nt
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- 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.

Question 3
What are the critical success factors for the implementation of a "Total Quality Management" programme?

Answer
Critical success factors of TQM:

- Focus on customer needs.
- Everyone in the organisation should be involved.
- Focus on continuous improvement.
- Design quality in product and production process.
- Effective performance measurement system.
- Rewards and performance measurements should be renewed.
- Appropriate training and education to everyone to understand the aim of TQM.

Question 4
List out the remedies available for difficulties experienced during implementation of PRAISE.

Answer
Remedies available for difficulties experienced in each step available during implementation of praise:

Sl. No.	**Activities**	**Remedies**
1.	Problem Identification	• Participate in programs like brain storming, multi voting, GD etc Precise definition of a problem and quantification.
2.	Ranking	• Participative approach • Subordination of individual to group approach.
3.	Analysis	• Lateral thinking/Brain storming.
4.	Innovation	• Systematic evaluation of all aspects of each strategy.
5.	Solution	• Effective internal communication. • Training of personnel/managers
6.	Evaluation	• Participative approach • Effective control system to track actual feedback system

Question 5
How can value analysis achieve cost reduction?

Answer
Value analysis can do cost reduction in the following manner:

- By identifying and removing unnecessary components in a product which had utility earlier.
- By introducing component substitution at a lesser cost without affecting the quality of the product.
- By simplifying the product design.
- By introducing alternative methods with less cost but improved efficiency.

Question 6
Classify the following items under the three measures used in the theory of constraints:
(i) Research and Development Cost
(ii) Rent/Utilities
(iii) Raw materials used for production
(iv) Depreciation
(v) Labour Cost
(vi) Stock of raw materials
(vii) Sales
(viii) Cost of equipments and buildings.)

Answer
The 3 key measures are :

Contribution:	(iii) Raw Material for production (vii) Sales
Operating Costs:	(ii) Rent/utilities (iv) Depreciation (v) Labour
Investments:	(i) R& D (vi) Raw Material Stock
	(viii) Building and Equipment Cost

Question 7
Name any four stage in the process of bench marking

Answer
Various stages in the process of benchmarking.

I Planning - Determination of benchmarking goal statement
- Identification of best performance
- Establishment of the benchmarking or process improvement team
- Defining the relevant benchmarking measures

II Collection of data and information
III Analysis of finding based on data collected
IV Formulation and implementation of recommendation
V Constant Monitoring and reviewing.

Question 8
Describe the Just-in-time systems

Answer
A complete JIT system begins with production, includes deliveries to a company's production facilities, continues through the manufacturing plant and even includes the types of transactions processed by the accounting system.

- The company must ensure that it receives it supplies on time, preferably directly at the production facility that needs them. The company engineers must assist suppliers at their premises and ensure defect free supplies. Thus raw material inventory is reduced if correct quantities are delivered as per production schedules.
- Long set-up times are reduced into short ones by eliminating inefficiency. Thus the WIP is reduced and so is the number of products before defects are identified.
- A 'Kanban' card, which authorizes production of the right quantity by its feeder machine ensures 'pulling' the production process and elimination of inventory. Another method is the introduction of a working cell, which is a cluster of machines run by a single trained operator. This also identifies defects quickly and reduces maintenance costs. Both methods are used together.
- Work force is trained to be empowered to halt operations understand more about the system, product flow, different machines and thus, elaborate reporting of a past variance is eliminated.
- Suppliers may be paid based on production units adjusted for defects.

Question 9
What is Backflushing in JIT? State the problems that must be addressed for the effective functioning of the system.

Answer
Back flushing requires no data entry of any kind until a finished product is completed. At the time the total amount finished is entered into the computer system, which multiplies it by all the components listed in the bill of materials for each item produced.
To work system properly some serious problems must corrected.

- Production reporting: The total production figure entered into the system must be absolutely correct.
- Scrap reporting: All abnormal scrap must be diligently tracked and recorded; otherwise these materials will fall outside the back flushing system and will not be charged to inventory.
- Lot tracing: Lot tracing is impossible under the back flushing system. It is required when a manufacturer need to keep records of which production lots were used to create a product in case all the items in a lot must be recalled.
- Inventory accuracy: Maintain accurate set of inventory records.

Question 10
Explain the major components of balanced score card.

Answer
Well disgned balanced score card combines financial measures of past performance with measures of the firm's drivers of future performance. Generally the Balanced Score Card has the following perspectives from which a company's activity can be evaluate

- Customer perspective i.e how customers see us?
- Internal perspective ie. In what processes must the firm excel?
- Innovation & learning perspective i.e,can we continue to improve and create value?
- Financial perspective i.e., how we look to our share holders?

Question 11
Classify the following measures under appropriate categories in a balanced score card for a banking company which excels in it s home loan products:
(i) A new product related to life insurance is being considered for a tie up with the successful housing loan disbursements.
e.g. every housing loan applicant to be advised to take a life policy or compelled to take a fire insurance policy.
(ii) How different sectors of housing loans with different interest rates have been sanctioned, their volumes of growth in the past 4 quarters.
(iii) How many days are taken to service a loan, how many loans have taken longer, what additional loans are to be released soon, e.t.c
(Students are not required to copy these statements into their answer books)

Answer
(i) New product tie up - Innovation/learning perspective
(ii) Growth of Volume - Financial perspective
(iii) Time for loan/Fresh products - Customer perspective

Question 12
Brief the principles associated with synchronous manufacturing.

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 7 principles are :

- Focus on synchronizing the production flow than on idle capacities.
- Value of time at a bottleneck resource is equal to the throughput rate of products processed by the bottle neck.
- Value of time at a non bottleneck resource is negligible.
- Level of utilization of a non bottleneck resource is controlled by other constraints within the system.
- Resources must be utilized, not simply activated.

- Transfer batch should not be equal to the process batch.
- A process batch should be variable both along its route and overtime.

Question 13
Mention the data required to operate the material requirement planning system.

Answer
Data requirements to operate material requirement planning system:

- The master Production schedule: This schedule specifies the quantity of each finished unit of products to be produced and the time at which each unit will be required.
- The Bill of material file:The bill of material file specifies the sub-assemblies, components and materials required for each of the finished goods.
- The inventory file:This file maintains details of items in hand for each sub-assembly, components and materials required for each of the finished goods.
- The routing file:This file specifies the sequence of operations required to manufacture sub-assemblies, components and finished goods.
- The master parts file:This file contains information on the production time of sub-assemblies; components produced internally and lead times for externally acquired items.

Question 14
Explain the pre-requisites for successful operation of material requirement planning.

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

- The latest production and purchasing schedules prepared should be strictly adhered to Day to Day change from predetermined schedules will cause chaos.
- 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.
- Work-force must be appraised of the system and the need for absolute adherence to the schedules prepared.
- Necessary internal control system should be developed to ensure total adherence to the schedule.
- Accuracy of the data supplied is vital to the MRP system.

6. Cost Concepts in Decision Making

Question 1
Explain briefly the concepts of Opportunity costs and Relevant costs.

Answer
Opportunity cost is a measure of the benefit of opportunity forgone when various alternatives are considered. In other words, it is the cost of sacrifice made by alternative action chosen. For example, 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. 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.

Question 2
Why is meant by incremental Revenue?

Answer
Incremental Revenue: Incremental revenue is the additional revenue that arise from the production or sale of a group of additional units. It is one of the two basic 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 of in the nature of activity.

Question 3
Distinguish between "Marginal cost" and 'Differential Cost".

Answer
Marginal cost represents the increase or decrease in total cost which occurs with a small change in output say, a unit of output. In Cost Accounting variable costs represent marginal cost.
Differential cost is the change (increase or decrease) in the total cost (variable as well as fixed) due to change in the level of activity, technology or production process or method of production.
In other words, it can be defined as the cost of one unit of product or service which would be avoided if that unit was not produced or provided.
The main point which distinguishes marginal cost and differential as that change in fixed cost when volume of production increases or decreases by a unit of production. In the case of differential cost variable as well as fixed cost. i.e. both costs change due to change in the level of activity, whereas under marginal costing only variable cost changes due to change in the level of activity.

Question 4
What are the applications of incremental cost techniques in making managerial decisions?

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:

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

Question 5
Comment on the use of opportunity cost for the purpose of decision-making

Answer
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.

Question 6
Explain with one example each that sun cost is irrelevant in making decisions, but irrelevant costs are not sunk costs.

Answer
Sunk cost is a historical cost incurred in the past. In other words it is a cost of a resource already acquired. Future decisions in respect of this resource will not be affected by it. For example, book value of machinery. Hence sunk costs are irrelevant in decision making.

Irrelevant costs are not necessary sunk costs. For example, when a comparison of two alternative production methods using the same material quantity is made, then direct material cost is not affected by the decision but this material cost is not sunk cost.

Question 7

"Sunk cost is irrelevant in decision-making, but irrelevant costs are not sunk costs". Explain with example.

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.

Question 8

Explain the concept of relevancy of cost by citing three examples each of relevant costs and non-relevant costs.

Answer

Relevant costs are those costs which are pertinent to a decision. In other words, these are the costs which are influenced by a decision. Those costs which are not affected by the decision are not relevant costs.

Examples of relevant costs are:

(1) All variable costs are relevant costs.
(2) Fixed Costs which vary with the decision are relevant costs.
(3) Incremental costs are relevant costs.

Examples of non-relevant costs:

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

Question 9

What are the applications of incremental/differential costs?

Answer

Applications of Incremental/Differential Cost:

1. Whether to process a product further or not.
2. Dropping or adding a product line.
3. Optimizing investment plan.
4. accepting an additional order from a special customer at lower than existing price.
5. Make or buy decision.

6. Opening a new sales territory or branch.
7. Optimizing investment plan out of multiple alternatives.
8. Submitting tenders.
9. Lease or buy decisions.
10. Equipment replacement decisions.

Question 10

Pick out from each of the following items, costs that can be classified under 'committed fixed costs' or 'discretionary fixed costs".

(i) Annual increase of salary and wages of administrative staff by 5% as per agreement

(ii) New advertisement for existing products is recommended by the Marketing Department for achieving sales quantities that were budgeted for at the beginning of the year.

(iii) Rents paid for the factory premises for the past 6 months and the rents payable for the next six months. Production is going on in the factory.

(iv) Research costs on a product that has reached 'maturity' phase in its life cycle and the research costs which may be needed on introducing a cheaper substitute into the market for facing competition.

(v) Legal consultancy fees payable for patent rights on anew product Patenting rights have been applied for.

Answer

Committed Fixed Cost		**Discretionary Fixed Cost**	
(i)	Salary and Wage increase	(ii)	New Advertisement Cost
(iii)	Rents Payable for the next 6 Months	(iv)	Research cost for substitutes
(v)	Legal Fees for filing for patent rights		

7. CVP Analysis & Decision Making

Question 1
Enumerate the limitations of using the marginal costing technique.

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

- It is difficult to classify exactly the expenses into fixed and variable category. Most of the expenses are neither totally variable nor wholly fixed.
- Contribution itself is not a guide unless it is linked with the key factor.
- 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.
- 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.
- 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.

Question 2
Briefly discuss on curvilinear CVP analysis.

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:

- after the saturation point of existing demand, the sales value may show a downward trend.
- the average unit variable cost declines initially, reflecting the fact that, as output increase 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 cost 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.

In such cases, the contribution will not increase in linear proportion i.e. based on the phenomenon of diminishing marginal productivity; the total cost lie 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 is earned at the point where the distance between sales and total cost is the greatest.

Question 3

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

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 summarized 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.

8. Pricing Decision

Question 1
What is Penetration pricing? What are the circumstances in which this policy can be adopted?

Answer
Penetration pricing: 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:
The three circumstances in which penetrating pricing policy can be adopted are as under:

- When demand of the product is elastic to price. In other words, the demand of the product increases when price is low.
- When there are substantial savings on large-scale production, here increase in demand is sustained by the adoption of low pricing policy.
- When there is threat of competition. The prices fixed at a low level act as an entry barrier to the prospective competitions.

Question 2
Explain Skimming pricing strategy.

Answer
Skimming pricing
It is a policy where the prices are kept high during the early period of a product's existence. This can be synchronised with high promotional expenditure and in the latter years the prices can be gradually reduced. The reasons for following such a policy are as follows:

- The demand is likely to be inelastic in the earlier stages till the product is established in the market.
- The gradual reduction in price in the latter years will tend to increase the sales.
- This method is preferred in the beginning because in the initial periods when the demand for the product is not known the price covers the initial cost of production.
- High initial capital outlays needed for manufacture, results in high cost of production. In addition to this, the producer 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.

Question 3

How Pareto analysis is helpful in pricing of product in the case of firm dealing with multi-products?

Answer

In the case of firm dealing with multi products, it would not be possible for it to analyse price-volume relationship for all of them. Pareto Analysis is used for analysing 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 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.

Question 4

Outline the features of penetration pricing strategy

Answer

- Penetration Pricing: It is a policy of using a low price as the principal instrument for penetrating mass markets early.
- This method is used for pricing a new product and to popularize it initially.
- 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.
- 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.
- The circumstances in which penetrating pricing can be adopted are:
    - **Elastic demand:** The demand of the product is high when price is low. Hence, lower prices mean large volumes and hence more profits.
    - **Mass Production:** When there are substantial savings in large-scale production, increase in demand is sustained by the adoption of low pricing policy.
    - **Frighten off competition:** The prices fixed at a low-level acts as an entry barrier to the prospective competitors. The use of this policy by existing concerns will discourage the new concerns to enter the market. This pricing policy is also known as "stay-out-pricing".

Question 5
What is Pareto Analysis? Name some applications.

Answer
Vilfredo Pareto, an Italian economist, observed that about 70 – 80% of value was represented by 30 – 20% of volume. This observation was found to exist in many business solutions.
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.

Question 6
State the general guidelines to be used in adopting a pricing policy in a manufacturing organization.

Answer
The general guidelines to be used in adopting a pricing policy are as under:

- The pricing policy should encourage optimum utilization of resources.
- The pricing policy should work towards a better balance between demand and supply.
- The pricing policy should promote exports.
- 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.

Question 7
Enumerate the uses of Pareto Analysis.

Answer
Pareto analysis is useful to:

- Prioritize problems, goals and objectives.
- Identify the root causes.
- Select and define the key quality improvement programs, key employee relations improvement programs etc.
- Verify the operating procedures and manufacturing processes.
- Allocate physical, financial and human resources effectively.
- Maximise research and product development time.

Question 8
Briefly explain skimming pricing and penetration pricing policies.

Answer

- **Skimming prices:** Policy of highly pricing a product at the entry level into the market and reducing it later.
  For example: Electronic goods, mobile phone, Flat, TVs, etc.
  It is used when market is price insensitive, demand inelastic or to recover high promotional costs.
- **Penetration Pricing:** Policy of entering the market with a low price, then establishing the product and then increasing the price. This is also used by companies with established markets, when products are in any stage of their life cycle, to avoid competition. This is also known as "stay-out pricing".
  For example, entry of a new model small segment car into the market.

Question 9
What are the disadvantages of Cost Plus Pricing ?

Answer
Disadvantages of cost plus pricing**:**

- If ignores demand, facts to take into account buyers' needs and willingness to pay.
- Fails to reflect competition adequately.
- Assumes correct cost estimation, whereas in multiproduct firm, costs may be arbitrarily allocated.
- In many decision, incremental costs are more relevant than full cost. This is ignored.
- 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.

Question 10
What is Price Discrimination? Under what circumstances it is possible?

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

9. Budget & Budgetary Control

Question 1
Explain briefly the major components of a balanced score card.

Answer
An ideal Balanced score card combines financial measures of past performance with measures of the firm's drivers of future performance. The following perspectives are evaluated:

- Customer perspective - Measures of price / delivery / quality / support.
- Internal perspective – Measures of efficiency / sales penetration and new product introduction.
- Innovation and learning perspective - Measures of technology / cost leadership.
- Financial perspective - Sales / Cost of sales / Return on capital employed etc.

Question 2
Describe the process of zero-base budgeting.

Answer
The zero Base Budgeting involves the following steps:

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

Question 3
"In many organisations, initiatives to introduce balanced score card failed because efforts were made to negotiate targets rather than to build consensus."
Required:
Elucidate the above statement.

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 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.

Question 4
What do you mean by a flexible budget? Give an example of an industry where this type of budget is typically needed?

Answer
A flexible budget is a budget which, by recognizing the difference between fixed, semi-variable and variable costs, is designed to change in relation to the level of activity attained.
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.

Question 5
Describe the four types of bench marking of critical success factors.

Answer
The Benchmarking is of following types:

- **Competitive benchmarking:** It involves the comparison of competitors products, processes and business results with own.
- **Strategic benchmarking:** It is similar to the process benchmarking in nature but differs in its scope and depth.
- **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.
- **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.
- **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.
- **Internal Benchmarking:** It involves seeking partners from within the same organization, for example, from business units located in different areas.
- **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.

Question 6
Explain briefly stages involved in the process of Bench marking.

Answer
Process of Benchmarking: 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:

1. Planning:

- **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.
- **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.
- **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.
- **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.

2. 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.

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

- Review the findings and produce tables, charts and graphs to support the analysts.
- Identify gaps in performance between our organisation and better performers.
- Seek explanations for the gaps in performance. The performance gaps can be positive, negative or zero.
- Ensure that comparisons are meaningful and credible.
- Communicate the findings to those who are affected.
- Identify realistic opportunities for improvements.

4. Recommendations: This involves:
Making recommendation: This requires:

- Deciding the feasibility of making the improvements in the light of the conditions that apply within own organisation.
- Agreement of the improvements that are likely to be feasible.
- Producing a report on the Benchmarking in which the recommendations are included.
- Obtaining the support of key stakeholder groups for making the changes needed.
- Developing action plan(s) for implementation.

5. Monitoring and reviewing: This involves:

- Evaluating the benchmarking process undertaken and the results of the improvements against objectives and success criteria plus overall efficiency and effectiveness.
- Documenting the lessons learnt and make them available to others.
- Periodically re-considering the benchmarks

10. Standard Costing

Question 1
"Overhead variances should be viewed as interdependent rather than independent". Explain.

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.

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

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

- 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.
- Distributing variances on pro-rata basis over the cost of sales, work-in-progress and finished goods stocks by using suitable basis.
- Write off quantity variance to profit and loss account and spread price variance over to cost of sales, work in progress and finished goods. The reason behind apportioning variance to inventories and cost of sales is that they represent costs although they are derived as variances.

Question 3
"Calculation of variances in standard costing is not an end in itself, but a means to an end." Discuss.

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.

11. Costing of Service Sector

Question 1
Discuss with examples, the basic costing methods to assign costs to services.

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.

Question 2
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

Answer

Service Sector	Cost Unit
Hotel	Bednights available
School	Student hours or no. of full time students
Hospital	Patient-day / Room day
Accounting firm	Client Hours
Transport	Passenger- Kms, or Quintal km or tonne- km
Staff Canteen	No. of Meals Provided or no. of staff
Machine Maintenance	Maintainance hours to user departments

Question 3
Explain the main characteristics of Service sector costing.

Answer
Main characteristics of service sector are as below:
(a) **Activities are labour intensive:** The activities of service sector generally are labour intensive. The direct material cost is either small or non-existent.

(b) **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.

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

Question 4

"Customer profile is important in charging cost." Explain this statement in the light of customer costing in service sector.

Answer

Customer costing in the service sector: The customer costing is a new approach to management. The central theme of this approach is customer satisfaction. In some service industries, such as public relations, the specific output of industry may be difficult to identify and even more difficult to quantify. Further there are multiple customers, identifying support activities i.e. common costs with particular customer may be more problematic. In such cases it is important to cost customer. An ABC analysis of customers profitability provides valuable information to help management in pricing customer .Consider a banking sector. A bank's activities for customer will include the following types of activities. These are:

i. Stopping a cheque
ii. Withdrawal of cash
iii. Updation of pass book
iv. Issue of duplicate pass book
v. Returning a cheque because of insufficient funds
vi. Clearing of a customer cheque.

Different customers or categories of customers use different amount of these activities and so customer profiles can be built up and customer can be charged according to the cost to serve them.

Customer profile is important in analyzing cost under the following categories

1. Customer specific costs: These are the direct and indirect cost of providing service to customer plus customer related cost assigned to each customer.

For example: cost of express courier service to a client who requests over-night delivery of some agreement.

2. Customer – line categories: These are the costs which are broken into broad categories of customers and not individual customers.

12. Transfer Pricing

Question 1
Indicate the possible disadvantages of treating divisions as profit centres.

Answer
The Possible disadvantages of treating divisions as profit centres are as follows:

- Divisions may compete with each other and may take decisions to increase profits at the expense of other divisions thereby overemphasizing short term results.
- It may adversely affect co-operation between the divisions and lead to lack of harmony in achieving organizational goals of the company. Thus it is hard to achieve the objective of goal congruence.
- It may lead to reduction I the company's overall total profits.
- The cost of activities, which are common to all divisions, may be greater for decentralized structure than centralized structure. It may thus result in duplication of staff activities.
- Top management looses control by delegating decision making to divisional managers. There are risks of mistakes committed by the divisional managers, which the top management, may avoid.
- Series of control reports prepared for several departments may not be effective from the point of view of top management.
- It may under utilize corporate competence.
- It leads to complications associated with transfer pricing problems.
- It becomes difficult to identity and defines precisely suitable profit centres.
- It confuses division's results with manager's performance.

Question 2
What are some goals of a 'transfer-pricing' system in an organization?

Answer
The goals of transfer pricing are that it should:
1. 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.
2. provide information which will be useful for evaluating the divisional performance.
3. seek to achieve goal congruence.
4. ensure that divisional autonomy is not undermined.

Question 3
What should be the basis of transfer pricing, if unit variable cost and unit selling price are not constant?

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.

Question 4

(a) 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.
(b) Discuss the potential for maximization of income by a multinational through the use of transfer pricing mechanism.

Answer

(a) Marketable Transfer Pricing Procedure

- 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.
- In case, the external market for the transferred good is not reasonable competitive, following two situations may arise in this case.
    - 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).
    - If there is no idle capacity: Under this situation opportunity cost should be added to outlay costs for determining minimum transfer price.

(b) 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:

- 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.
- 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.
- 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.
- 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.

- 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.

13. Uniform Costing and Inter Firm Comparison

Question 1
What are the requisites for the installation of a uniform costing system ?

Answer
Requisites for the installation of uniform costing: Essential requisites for the installation of uniform costing are as under:

- The firm's in the industry should be willing to share / furnish relevant data or information.
- A spirit of cooperation and mutual trust should prevail among the participating firms.
- Mutual exchange of ideas, methods used, special achievement made, research and know how etc. should be frequent.
- 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.
- In case of accounting methods, principles, procedure and production method uniformity must be established.

Question 2
What is uniform costing? Why is it recommended?

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.

Question 3
What are the essential requisites for the installation of Uniform costing system?

Answer
Essential Requisites for Installation of Uniform Costing System:

- Firms should be willing to share or furnish relevant data /information.
- Spirit of mutual trust and co-operation should prevail among participating firms.
- Mutual exchange of ideas, methods used, special achievements made, research and know – how should be frequent.
- Bigger firms should lead in sharing their experience to enable smaller firms to improve their performance.
- Uniformity should be established with regard to the size of units, production methods, accounting methods, procedures and principles used.

14. Cost Sheet, Profitability Analysis And Comparison

Question 1

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

Answer

Cost classification is the process of grouping costs according to their characteristics. Costs are classified or grouped according to their common characteristics. Costs may be classified according to elements, according to functions or operations, according to their behaviour, according to controllability or according to normality.

The break up of the aggregate costs into relevant types, is an essential pre-requisite of decision making as well as of controlling costs. Classification of costs on different bases is thus necessary for various purposes. For the purpose of decision-making and control, costs are distinguished on the basis of their relevance to different type of decisions and control functions. The importance of distinguishing cost 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 o the basis of certain assumptions. This is so because direct costs are controllable at the operational level whereas indirect costs are not amenable to such control.

15. Linear Programming

Question 1
What are the practical applications of Linear programming?

Answer
Linear programming can be used to find optional solutions under constraints.

- **In production:**
    - pdt. mix under capacity constraints to minimise costs/maximise profits along with marginal costing.
    - Inventory management to minimise 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 pdn. management and pdt. mix. Assignment of personnel 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.

Question 2
Explain the concept and aim of theory of constraints. What are the key measures of theory of constraints?

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:

- **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.

- **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.
- **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.

Question 3

Write short notes on the characteristics of the dual problem.

Answer

Characteristics of the dual problem:

- For any linear programming model called primal model, there exists a companion model called the dual model.
- The number of constraints in the primal model equals the number of variables in the dual model.
- The number of variables in the primal problem equals the number of constraints in the dual model.
- If the primal model is a maximization problem then the dual model will be of the form less than or equal to, "≤" while the restrictions in the dual problem will be of the form-greater than or equal to, "≥".
- The solution of the prima; model yields the solution of the dual model. Also, an optimal simplex table for the dual model yields the optimal solution to the primal model. Further, the objective functions of the two optimal tables will have identical values.
- Dual of the prima's dual problem is the primal problem itself.
- Feasible solutions to a primal and dual problem are both optimal if the complementary slackness conditions hold, that is, (value of a primal variable) x (value of the corresponding dual surplus variable) = 0 or (value of a primal slack variable) x (value of the corresponding dual variable) = 0.
  If this relationship does not hold, than either the primal solution or the dual solution or both are no optimal.
- If the primal problem has no optimal solution because of infeasibility, then the dual problem will have no optimal solution because of unboundedness.
- If the primal has no optimal solution because of unboundedness, then the dual will have no optimal solution because of infeasibility.

16. The Transportation Problem

Question 1
State the methods in which initial feasible solution can be arrived at in a transportation problem

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)

Question 2
Explain the term degeneracy in a transportation problem.

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.

Question 3
Will the initial solution for a minimization problem obtained by Vogel's Approximation Method and the Least Cost Method be the same ? Why?

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.

17. The Assignment Problem

Question 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?

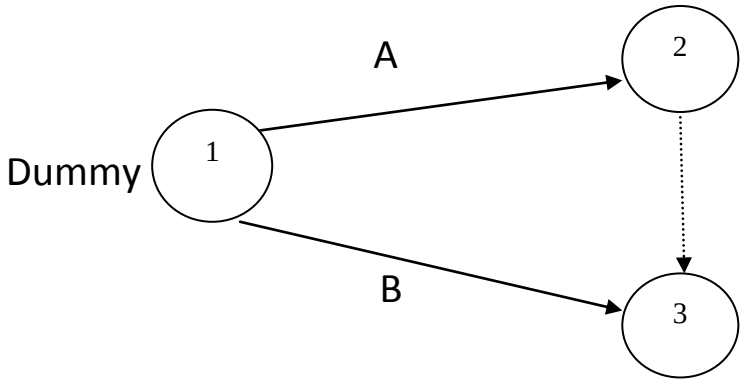
Answer

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.

18. Critical Path Analysis

Question 1
Explain the following in the context of a network:
(i) Critical path
(ii) Dummy activity.

Answer
(i) Critical Path:
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.
(ii) Dummy Activities:
Dummy Activity is that activity which does not consume time or resources. It is used when two or more activities have same initial and terminal events. As a result of using dummy activities, other activities can be identified by unique end events. These are usually shown by arrows with dashed lines.



Question 2
List the 5 steps involved in the methodology of critical path analysis.

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

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

- Determine the interdependence and sequence of specific activities and prepare a net-work.
- Assign estimates of time, cost or both to all the activities of the network.
- Identify the longest or critical path through the network.
- Monitor, evaluate and control the progress of the project by re-planning, rescheduling and reassignment of resources.

19. Program Evaluation and Review Technique

Question 1
Write short notes on Distinction between PERT and CPM.

Answer
Distinction between PERT and CPM: The PERT and CPM models are similar in terms of their basic structure, rationale and mode of analysis. However, there are certain distinctions between PERT and CPM networks which are enumerated below:

- CPM is activity oriented i.e. CPM network is built on the basis of activities. Also results of various calculations are considered in terms of activities of the project. On the other hand, PERT is even oriented.
- CPM is a deterministic model i.e. it does not take into account the uncertainties involved in the estimation of time for execution of a job or an activity. It completely ignores the probabilistic element of the problem. PERT, however, is a probabilistic model. It uses three estimates of the activity time; optimistic, pessimistic and most likely, with a view to take into account time uncertainty. Thus, the expected duration for each activity is probabilistic and expected duration indicates that there is fifty per probability of getting the job done within that time.
- CPM laces dual emphasis on time and cost and evaluates the trade-off between project cost and project item. By deploying additional resources, it allows the critical path project manager to manipulate project duration within certain limits so that project duration can be shortened at an optimal cost. On the other hand, PERT is primarily concerned with time. It helps the manger to schedule and coordinate various activities so that the project can be completed on scheduled time.
- CPM is commonly used for those projects which are repetitive in nature and where one has prior experience of handling similar projects. PERT is generally used for those projects where time required to complete various activities are not known as prior. Thus, PERT is widely used for planning and scheduling research and development project.

Question 2
Define a project and briefly explain the four common implications which characterize a project, and state the five steps of the working methodology of critical path analysis.

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 spacecraft to the mars.

All these projects are characterized 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 coordinated for completion of the project.
- 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 undertaken substantially in the same form.
- Uncertain and critical dates: During of the various activities involved in such projects are usually uncertain. Further in such type of projects, many critical dates exits by which operations must be completed in order to complete the entire project on schedule.
- 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.

The working methodology of Critical Path Analysis (CPA) which includes both CPM and PERT, consists of following five steps:

- Analyse and breakdown the project in terms of specific activities and / or events.
- Determine the interdependence and sequence of specific activities and prepare a network,
- Assign estimates of time, cost or both to all the activities of the network.
- Identify the longest or critical path through the network.
- Monitor, evaluate and control the progress of the project by re-planning, rescheduling and reassignment of resources.

20. SIMULATION

Question 1
(i) What is simulation?
(ii) What are the steps in simulation?

Answer

- Simulation is a quantitative procedure which describes a process by developing a model of that process and then conducting a series of organized trial and error experiments to product the behaviour of the process over time.
- Steps in the simulation process:
  - Define the problem and system you intend to simulate.
  - Formulate the model you intend to use.
  - Test the model, compare with behaviour of the actual problem environment.
  - Identify and collect data to test the model.
  - Run the simulation.
  - Analyse the results of the simulation and, if desired, change the solution you are evaluating.
  - Rerun the simulation to tests the new solution.
  - Validate the simulation i.e., increase the chances of valid inferences.

Question 2
How would you use the Monte Carlo Simulation method in inventory control?

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.

Question 3

State major reasons for using simulation technique to solve a problem and also describe basic steps in a general simulation process.

Answer

Reasons:

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

Steps:

(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.

Question 4

Write a short note on the advantages of simulation.

Answer

Advantages of simulation are enumerated below:

- Simulation techniques allow experimentation with a model of the system rather than the actual operating system. Sometimes experimenting with the actual system itself could prove to be too costly and, in many cases too disruptive. For example, if you are comparing two ways of providing food service in a hospital, the confusion that would result from operating two different systems long enough to get valid observations might be too great. Similarly, the operation of a large computer central under a number of different operating alternatives might be too expensive to be feasible.

- The non-technical manage can comprehend simulation more easily than a complex mathematical model. Simulation does not require simplifications and assumptions to the extent required in analytical solutions. A simulation model is easier to explain to management personnel since it is a description of the behaviour of some system or process.

- Sometimes there is not sufficient time to allow the actual system to operate extensively. For example, if we were studying long-term trends in world population, we simply could not wait the required number of years to see results. Simulation allows the manger to incorporate time into an analysis. In a computer simulation of business operation the manager can compress the result of several years or periods into a few minutes of running time.
- Simulation allows a user to analyze these large complex problems for which analytical results are not available. For example, in an inventory problem if the distribution for demand and lead time for an item follow a standard distribution, such as the poison distribution, then a mathematical or analytical solution can be found. However, when mathematically convenient distributions are not applicable to the problem, an analytical analysis of the problem may be impossible. A simulation model is a useful solution procedure for such problems.

21. Learning Curve Theory

Question 1
Discuss the application of the learning curve.

Answer
Application of Learning curve: Learning curve helps to analyse cost-volume profit relationships during familiarisation 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.

Question 2
What are the distinctive features of learning curve theory in manufacturing environment? Explain the learning curve ratio.

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.
(vi) Rejections and rework tend to diminish over time.
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.

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

Question 3
The following information is provided by a firm. The factory manager wants to use appropriate average learning rate on activities, so that he may forecast costs and prices for certain levels of activity.

(i) A set of very experienced people feed data into the computer for processing inventory records in the factory. The manager wishes to apply 80% learning rate on data entry and calculation of inventory.
(ii) A new type of machinery is to be installed in the factory. This is patented process and the output may take a year for full fledged production. The factory manager wants to use a learning rate on the workers at the new machine.
(iii) An operation uses contract labour. The contractor shifts people among various jobs once in two days. The labour force performs one task in 3 days. The manager wants to apply an average learning rate for these workers.
You are required to advise to the manager with reasons on the applicability of the learning curve theory on the above information.

Answer
The learning curve does not apply to very experienced people for the same job, since time taken can never tend to become zero or reduce very considerably after a certain range of output. This is the limitation of the learning curve.

- Data entry is a manual job so learning rate theory may be applied. Calculation of inventory is a computerized job. Learning rate applies only to manual labour.
- Learning rate should not be applied to a new process which the firm has never tried before.
- The workers are shifted even before completion of one unit of work. Hence learning rate will not apply.

Question 4
Explain distinctive features of learning curve theory in manufacturing environment.

Answer
The production quantity of a given item doubled the cost of that item decrease at a fixed rate. This phenomenon is the basic premise on which the theory of learning curve has been formulated.
The distinctive features of a learning curve are:
1. Better tooling methods are developed and used
2. More productive equipments are designed and used to make the product.
3. Design bugs are detected and corrected.
4. Better design engineering reduces material and labour costs.
5. Early teething problems are overcome. As production progresses management is prompted to achieve better planning and better management.
6. Rejections and rework tend to diminish over time.
7. As quantity produced increases the Cost per unit decreases, since each unit entails:
(i) Lesser labour (ii) Greater productivity of material and labour (iii) Fewer delays and lesser time losses.