

Star Rating

On the basis of Maximum marks from a chapter

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On the basis of Questions included every year from a chapter

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On the basis of Compulsory questions from a chapter

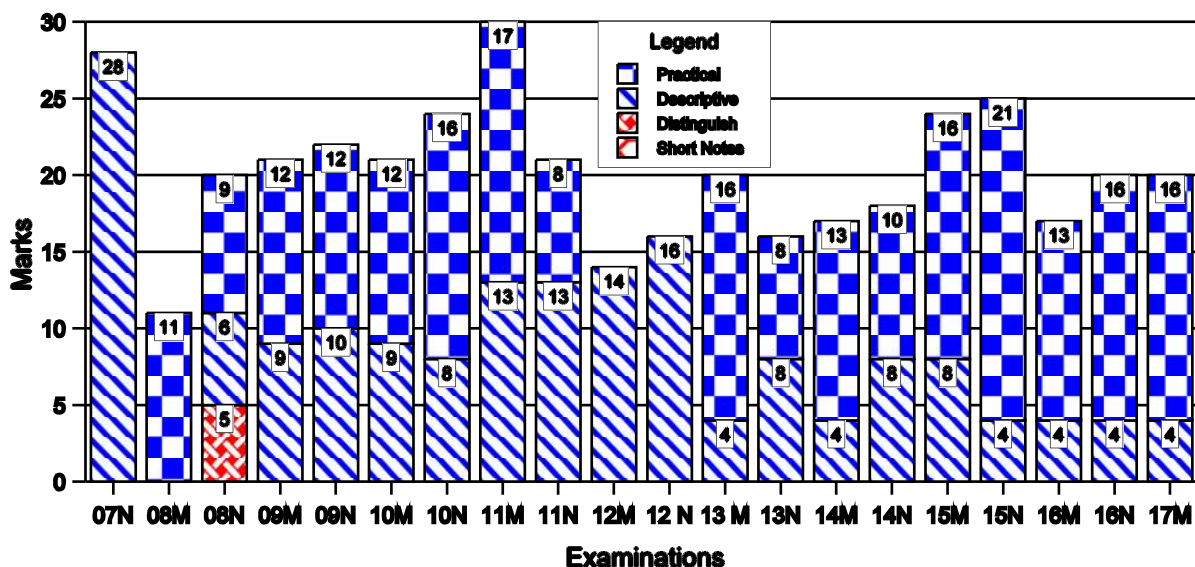
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1

Developments in the Business Environment

This Chapter Includes: Introduction; Origin; Advantages; features and Problems of Target Costing; Role in Target Costing Environment; Target Costing data flow; Target Costing Control points; Implementing a Target Costing System. Product Life Cycle; Phases; Characteristics, Features, Benefits and Various Stages of Life Cycle. Introduction; Description of Just-in-Time systems; Methods. Introduction; Meaning; Definitions; Stages; Purposes and Benefits of Activity Based Costing; Activity Based Cost Management. Introduction; Operationalising Total Quality Management; Overcoming Total Quality Paralysis; Control. Introduction; Scope; Definition; Competitive advantage and customer value; Role of Management Accountant; Value chain approach for assessing competitive advantage; Strategic framework for Value Chain Analysis; Organisational and Managerial Accounting Challenges; Value Chain Analysis Vs. Conventional Management Accounting.

Marks of Short Notes, Distinguish Between, Descriptive & Practical Questions



CA Final Gr. II

DESCRIPTIVE QUESTIONS

2007 - Nov [5] (a) "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. (5 marks)

Answer:

An organization commits cost at:

1. The time of deciding the quality of raw material and other resources.
2. The time of deciding the product design.
3. The time of deciding the technology.
4. The time of deciding about the marketing strategy.

Costs are also incurred at the time of actual production and distribution. These costs thus cannot be reduced at the time they incur.

However it is said that costs can be managed at the point of commitment through the use of cost drivers which may be structural or executional. Structural cost drivers are those which can be managed by effecting structural changes e.g. scale of operation, technology, experience etc.

Executional cost drivers are those which can be managed by executive decisions. e.g. capacity utilization plant layout, linkage with suppliers and customers etc.

Thus cost drivers drive consumption of resources. These can be managed only at the point of structural and executional operating decisions.

2007 - Nov [5] (b) Explain the main features of 'Enterprise Resource Planning'. (4 marks)

Answer:

Features of ERP are as follows:

1. **Provides information:**

It provides company-wide integrated information systems covering all functional areas.

2. **Performs core activities and provides customer service:**
It performs core activities and increases customer services thereby projecting the corporate image.
3. **Shares information:**
It bridges the information gap in the organization.
4. **Project management:**
It offers a solution to better project management.
5. **E-com facilities:**
It allows for automatic introduction of latest technology like electronic fund transfer, etc.
6. **Decision-making:**
It eliminates the business problems like shortage of materials, inventory problems etc.
7. **Futuristic:**
It provides for improving and refining the business process.

KZ - 1**Knowledge Zone**

- (i) **Meaning of ERP:** ERP refers to a software which integrates all departments and functions across a company into a single computer system that can serve all those needs of different departments. It combines all computerised departments together with the help of a single integrated software program that uses a single database so that various departments can more easily share information and communicate with each other.
- (ii) **Benefits of ERP are as follows:**
1. ERP helps in the determination of the cost of products.
 2. ERP enables the companies to efficiently deliver the right product from right warehouse to right customer at right time.
 3. ERP improves production planning.
 4. In the case of multi-national, multi-company and multi-site manufacturing distribution environment, ERP simplifies the procedures by allowing one plan manage companies in different companies.
 5. It enables quick response to changes in business operations and market conditions.

2007 - Nov [6] (a) 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? (10 marks)

Answer:

Fundamental difference between ABC and Traditional costing system are as follows: Under conventional or traditional costing system, OH are first allocated and apportioned to cost centres and then absorbed to cost objects. Under ABC, OH are first assigned to activity pools and then assigned to cost objects.

Thus traditional costing system use volume based method to recover OH. While in ABC OH is distributed on the consumption of resources consumed by the product or service.

2007 - Nov [6] (b) 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. (9 marks)

Answer:

Target Costing

Meaning and concept:

It is a management tool used for reducing a product costs over its entire life cycle. It is driven by external market factors. A target market price is determined by marketing management prior to designing and introducing a new product. This target price is set at a level that will permit the company to achieve a desired market share and sales volume. A desired profit margin is then deducted to determine the target maximum allowable product cost. Target costing also develop methods for achieving those targets and means to test the cost effectiveness of different cost-cutting scenarios.

Stages to the methodology

Please refer KZ - 4 on page no. 96

Steps involved in Target Costing Approach to Pricing

Please refer KZ - 5 on page no. 97

PRACTICAL QUESTIONS

2008 - May [4] (a) Biscuit Ltd. manufactures 3 types of biscuits, A, B and C, in a fully mechanised factory. The company has been following conventional method of costing and wishes to shift to Activity Based Costing System and therefore wishes to have the following data presented under both the system for the month.

Inspection cost	₹ p.m.	73,000			
Machine – Repairs & maintenance	₹ p.m.	1,42,000			
Dye cost	₹ p.m.	10,250			
Selling overheads	₹ p.m.	1,62,000			
			Pdt A	B	C
Prime cost (₹ per unit)			12	9	8
Selling price (₹ per unit)			18	14	12
Gross production (unit/ production run)			2,520	2,810	3,010
No. of defective units / production run			20	10	10
Inspection:					
No. of hours / production run			3	4	4
Dye cost / production run (₹)			200	300	250
No. of machine hours / production run			20	12	30
Sales – No. of units / month			25,000	56,000	27,000

The following additional information is given:

- (i) No accumulation of inventory is considered. All good units produced are sold.
- (ii) All manufacturing and selling overheads are conventionally allocated on the basis of units sold.
- (iii) Product A needs no advertisement. Due to its nutritive value, it is readily consumed by diabetic patients of a hospital. Advertisement costs included in the total selling overhead is ₹ 83,000.
- (iv) Product B needs to be specially packed before being sold, so that it meets competition. ₹ 54,000 was the amount spent for the month in specially packing B, and this has been included in the total selling overhead cost given.

You are required to present product wise profitability of statements under the conventional system and the ABC system and accordingly rank the products. (11 marks)

Answer:

Sales	A	B	C	Total
(i) Units	25,000	56,000	27,000	1,08,000
Selling price/unit (₹)	18	14	12	
(ii) Sales Value (₹)	4,50,000	7,84,000	3,24,000	15,58,000
(iii) Prime Cost Overhead	12	9	8	
(iv) No. of units/run	2,520	2,810	3,010	
(v) Prime Cost ₹	3,02,400	5,05,800	2,16,720	
(vi) Gross Margin (ii - v)	1,47,600	2,78,200	1,07,280	5,33,080
	Total	A	B	C

Inspection Cost

$\left(\frac{7,3000}{146} \times 30/80/36 \text{ respectively} \right)$	73,000	15,000	40,000	18,000
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Machine Maintenance

$\left(\frac{1,42,000}{710} \times 200/240/270 \text{ respectively} \right)$	1,42,000	40,000	48,000	54,000
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Dye Cost

	<u>10,250</u>	<u>2,000</u>	<u>6,000</u>	<u>2,250</u>
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Sub Total

	<u>2,25,250</u>	<u>57,000</u>	<u>94,000</u>	<u>74,250</u>
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Selling Overhead Advertisement

$\left(\frac{83,000}{56+27} \times 56/27 \text{ respectively} \right)$	83,000	—	56,000	27,000
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Other Overheads

$\left(\frac{25,000}{108} \times 25/56/27 \text{ respectively} \right)$	25,000	5,787	12,963	6,250
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Packing

	<u>54,000</u>		<u>54,000</u>	
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Sub Total Selling Overhead

	<u>1,62,000</u>	<u>5,787</u>	<u>1,22,963</u>	<u>33,250</u>
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Working Notes:

	A	B	C	Total
Gross Production/unit/run (1)	2,520	2,810	3,010	
Defective/run (2)	20	10	10	
Good unit /run (3)	2,500	2,800	3,000	

Sales (Goods units)(4)	25,000	56,000	27,000	
No. of runs (5)	10	20	9	
Gross Production (6) =(1) × (5)	25,200	56,200	27,090	
Prime Cost /unit(7)	12	9	8	
Prime Cost (8) ₹	3,02,400	5,05,800	2,16,720	10,24,920
Inspection hours/run (9)	3	4	4	
Inspection hours (10) = (9) × (5)	30	80	36	146
M/c hours/ run (11)	20	12	30	
M/c Cost/run (13)	200	300	250	
M/c hours(12) = (1) × (5)	200	240	270	710
Dye Cost (14) = (13) × (5)	<u>2,000</u>	<u>6,000</u>	<u>2,250</u>	<u>10,250</u>

Conventional Accounting System

	Total	A	B	C
Sales - units/ Production (good units)	1,08,000	25,000	56,000	27,000
Gross Margin (₹)	5,33,080	1,47,600	2,78,200	1,07,280
Production overheads (₹)	2,25,250	52,141	1,16,797	56,313
Selling Overhead (₹)	1,62,000	37,500	84,000	40,500
Sub-Total Overhead (₹)	3,87,250	89,641	2,00,797	96,813
Net profit (₹)	1,45,830	57,959	77,403	10,467
Ranking		II	I	III

Activity Based System

	A	B	C
Sales - unit/ prod (good units)	<u>25,000</u>	<u>56,000</u>	<u>27,000</u>
Gross Margin (₹)	<u>1,47,600</u>	<u>2,78,200</u>	<u>1,07,280</u>
Prod OH	57,000	94,000	74,250
Selling OH	<u>5,787</u>	<u>1,22,963</u>	<u>33,250</u>
Sub Total (OH)	<u>62,787</u>	<u>2,16,963</u>	<u>1,07,500</u>
Net Profit	<u>84,813</u>	<u>61,237</u>	<u>(220)</u>
Ranking	I	II	III

CA Final Gr. II (New Course)

DISTINGUISH BETWEEN

2008 - Nov [2] (b) Differentiate between 'Traditional Management Accounting' and 'Value Chain Analysis in the strategic framework'. (5 marks)

Answer:

	Basis	Value Chain Analysis	Traditional Management Accounting
1.	Focus	Focus is external.	Focus is internal.
2.	Nature of Data	Both external and internal informations.	Only internal information.
3.	Cost preference	Focus not only on cost control and cost reduction but also on gaining competitive advantage.	Focus only on cost control and cost reduction.
4.	Number cost drivers	Multiple cost drivers are adopted which may be (i) Structural drivers. (ii) Executional drivers.	A single cost driver is adopted.
5.	Use of Cost Drivers	For each value activity a set of unique cost driver is used.	Cost driver is applied at the overall firm level.
6.	Cost Containment Philosophy	It views cost containment as a function of cost drivers regulating each value activity.	It seeks adhoc cost reduction solutions by focusing on variance analysis performance evaluation.
7.	Bench marking	It focuses on full fledged bench marking, "learning from competitors", but exploiting one's own strengths to gain advantage.	Bench marking is partially present and is restricted only to the financial level and not operational level.

DESCRIPTIVE QUESTIONS

2008 - Nov [7] (b) Describe the Just-in-time systems. (6 marks)

Answer:

Just-in-Time

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.

- (i) The company must ensure that it receives its 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.
- (ii) 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.
- (iii) 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.
- (iv) 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.
- (v) Suppliers may be paid based on production units adjusted for defects.

2009 - May [3] (b) What is disinvestment strategy? Highlight the main reasons for disinvestment (4 marks)

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 whereby the wholly owned subsidiaries may be floated as independently quoted companies.

Reason for Divestment Strategy:

1. In case of a firm having an opportunity to get more profitable product or segment but have resource constraint, it may sell off its unprofitable or less profitable division and utilized the recourse so released. Cost Benefit analysis and Capital Budgeting Methods are the useful tools for analyzing this type of situation.
2. 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.
3. In case where any business segment or product or subsidiary is pulling down the profit of the whole organization, it is better to cut down that operation of the product or business segment.

2009 - May [7] (b) Explain the essential features of Life-cycle costing.

(5 marks)

Answer:**Life-cycle costing**

Meaning: 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.

Features:

1. Product life cycle costing involves tracing of costs and revenues of each product over the several calendar periods throughout their entire life cycle.
2. Product life cycle costing traces research and design and development costs and total magnitude of these costs for each individual product and compared with product revenue.
3. Report generation for costs and revenues.

Benefits:

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

2. Better decision should follow from a more accurate and realistic assessment of revenues and costs, at least within a particular life cycle stage.
3. Product life cycle thinking can promote long-term rewarding in contrast to short - terms profitability rewarding.
4. It provides an overall framework for considering total incremental costs over the life span of a product.

2009 - Nov [3] (b) What are the critical success factors for the implementation of a 'Total Quality Management' programme? (5 marks)

Answer:

Success factors of TQM:

1. Everyone within the organization should be involved in TQM.
2. The focus should be on customer needs.
3. The focus should be on continuous improvement.
4. The aim should be to design and produce quality products.
5. Appropriate training and education should be given so that everyone is aware of the aims of TQM.
6. Existing rewards and performance measurements should be renewed to encourage quality improvements.
7. Introduce an effective performance measurement system that measures continuous improvements from the customer's perspective.

2009 - Nov [3] (c) How can value analysis achieve cost reduction?

(5 marks)

Answer:

In order that a firm survives and prospers in an industry it must meet two criteria.

- (i) it must supply what customers want to buy.
- (ii) it must survive competition. A firm can gain competitive advantage not merely by matching or surpassing its competitors but by satisfying customers needs and wants and even exceeding customer's expectations. this is done through Value Chain Analysis.

The idea of value chain was first suggested by Michael Porter (1985) to depict how customer value accumulates along a chain of activities that lead to an end product or service.

Porter 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 activity themselves.”

Porter classified business activities under two heads:

1. **Primary activities** are directly involved in transforming inputs into outputs and delivery and after-sales support to output. They include:
 - (i) material handling and warehousing
 - (ii) transforming inputs into final product
 - (iii) order processing and distribution
 - (iv) communication, pricing and channel management, and
 - (v) installation, repair and parts replacement.
2. **Support activities** are the activities which support primary activities. They are handled by the organization’s staff functions. They include the following:
 - (i) **Procurement-** purchasing of raw materials, supplies and other consumable items as well as assets.
 - (ii) **Technology Development-** know-how, procedures and technological inputs needed in every value chain activity.
 - (iii) **Human Resource Management-** selection, promotion and placement, appraisal, rewards; management development; and labour/employee relations.
 - (iv) **Firm Infrastructure-** general management, planning, finance, accounting, legal, government affairs and quality management.

Importance of Value Chain Analysis for Cost Management:

The firms use the value chain approach to better understand which segments, distribution channels, price points, product differentiation, selling propositions and value chain configurations will yield them the greatest competitive advantage.

Competitive advantage with regard to products and services takes two possible forms. The first one is an offering or differentiation advantage. If customers perceive a product or service as superior, they become more willing to pay a premium price relative to the price they will have to pay for competing

offerings. The second is relative low-cost advantage, under which customers gain when a company's total costs undercut those of its average competitor.

These types of analysis are not mutually exclusive. Rather, firms begin by focusing on their internal operations and gradually widening their focus to consider their competitive position within their industry.

Value Chain Analysis - as a cost reduction tool: In value analysis each and every product or component of a product is subjected to a critical examination so as to ascertain its utility in the product, its cost, cost benefit ratio, and better substitute etc. When the benefits are lower than the cost, advantage may be gained by giving up the activity concerned or replacing it for betterment. The best product is one that will perform satisfactorily at the lowest cost.

The various steps involved in value analysis are:

1. identification of the problem;
2. Collecting information about function, design, material, labour, overhead costs, etc., of the product and finding out the availability of the competitive products in the market; and
3. exploring and evaluating alternatives and developing them.

2010 - May [3] (b) What is Back flushing in JIT? State the problems that must be addressed for the effective functioning of the system. (4 marks)

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 be corrected.

1. **Production reporting:** The total production figure entered into the system must be absolutely correct.
2. **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.
3. **Lot tracing:** Lot tracing is impossible under the back flushing system. It is required when a manufacturer needs to keep records of which production lots were used to create a product in case all the items in a lot must be recalled.

4. **Inventory accuracy:** Maintain accurate set of inventory records.

2010 - May [5] (c) Brief the principles associated with synchronous manufacturing. (5 marks)

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:

1. Focus on synchronizing the production flow than on idle capacities.
2. Value of time at a bottleneck resource is equal to the throughput rate of products processed by the bottle neck.
3. Value of time at a non bottleneck resource is negligible.
4. Level of utilization of a non bottleneck resource is controlled by other constraints within the system.
5. Resources must be utilized, not simply activated.
6. Transfer batch should not be equal to the process batch.
7. A process batch should be variable both along its route and overtime.

2010 - Nov [2] (b) List out the remedies available for difficulties experienced during implementation of PRAISE. (4 marks)

Answer:

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

S. 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	<ul style="list-style-type: none"> • Participative approach. • Sub ordination of individual to group approach.
3.	Analysis	<ul style="list-style-type: none"> • Lateral thinking/Brain storming.
4.	Innovation	<ul style="list-style-type: none"> • Systematic evaluation of all aspects of each strategy.
5.	Solution	<ul style="list-style-type: none"> • Effective internal communication. • Training of personnel/managers.

6.	Evaluation	<ul style="list-style-type: none"> • Participative approach. • Effective control system to track actual feedback system.
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2010 - Nov [6] (b) Mention the data required to operate the material requirement planning system. (4 marks)

Answer:

Data requirements to operate material requirement planning system:

- 1. 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.
- 2. The Bill of material file:** The bill of material file specifies the sub-assemblies, components and materials required for each of the finished goods.
- 3. 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.
- 4. The routing file:** This file specifies the sequence of operations required to manufacture sub-assemblies, components and finished goods.
- 5. The master parts file:** This file contains information on the production time of sub-assemblies and components produced internally and lead times for externally acquired items.

2011 - May [4] Answer the following:

- (c) 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. (4 marks)

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	

2011 - May [4] (e) Name any four stages in the process of bench marking.
(4 marks)

Answer:

Various stages in the process of benchmarking:

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

Process II: Collection of data and information

Process III: Analysis of finding based on data collected

Process IV: Formulation and implementation of recommendation.

Process V: Constant Monitoring and reviewing.

2011 - May [6] (a) Explain the pre-requisites for successful operation of material requirement planning.
(5 marks)

Answer:

Pre-requisites for successful operation of MRP system are:

1. Accuracy of the data supplied is vital to the MRP system.
2. The latest production and purchasing schedules prepared should be strictly adhered to Day to Day change from predetermined schedules will cause chaos.
3. 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.
4. Work-force must be appraised of the system and the need for absolute adherence to the schedules prepared.
5. Necessary internal control system should be developed to ensure total adherence to the schedule.

2011 - Nov [1] {C} (d) Classify the following items under appropriate categories of quality costs viz.

Prevention Costs, Appraisal Costs, Internal Failure Costs and External Failure Costs:

- (i) Rework
- (ii) Disposal of scrap
- (iii) Warranty Repairs
- (iv) Revenue loss
- (v) Repair to manufacturing equipment
- (vi) Discount on defective sale
- (vii) Raw material inspection
- (viii) Finished product inspection
- (ix) Establishment of quality circles
- (x) Packaging inspection

(5 marks)

Answer:

- | | |
|--|------------------|
| (i) Rework | Internal Failure |
| (ii) Disposal of Scrap | Internal Failure |
| (iii) Warranty Repairs | External Failure |
| (iv) Revenue Loss | External Failure |
| (v) Repairs to Manufacturing Equipment | Internal Failure |
| (vi) Discount on Defective Sales | External Failure |
| (vii) Raw Material Inspection | Prevention Cost |
| (viii) Finished Product Inspection | Appraisal Cost |
| (ix) Establishment of Quality Circles | Prevention Cost |
| (x) Packaging Inspection | Appraisal Cost |

2011 - Nov [7] Answer the following:

(c) Briefly explain the phases in the life cycle of a product. (4 marks)

Answer:

Phases in Life Cycle of a Product

Phase	Characteristics
Introduction	Product is launched. Profits are almost non-existent. Competition is almost negligible.
Growth	Sales/Profits rise rapidly. Competition enters. At phase end, profits begin to decline.

Maturity	Sales increases but at a declining rate. Some firms extend their product lines with new models.
Saturation and decline	Drop in sales volume, need for product demand disappears. Better and cheaper substitutes are available in the market.

2011 - Nov [7] Answer the following:

- (e) Explain the concept of Just In Time approach in a production process.
(4 marks)

Answer:

Please refer 2008 - Nov [7] (b) on page no. 21

2012 - May [1] {C} (d) State whether each of the following independent activities is value-added or non-value-added:

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

Answer:

Sl. No.	Item	Activity
(i)	Polishing furniture used by a Systems Engineer in a software firm	Non-value added
(ii)	Maintenance by a software company of receivables management software for a banking company	Value-added
(iii)	Painting of pencils manufactured by a pencil factory	Value-added
(iv)	Customers' computer key board cleaning by a computer repair centre	Value-added
(v)	Providing brake adjustments in cars for repairs by a care service station.	Value-added

2012 - May [3] (c) State with a brief reason whether you would recommend an activity based system of costing in each of the following independent situations:

- (i) Company K produces one product. The overhead costs mainly consist of depreciation.
- (ii) Company L produces 5 different products using different production facilities.
- (iii) A consultancy firm consisting of lawyers, accountants and computer engineers provides management consultancy services to clients.
- (iv) Company S produces two different labour intensive products. The contribution per unit in both products is very high. The BEP is very low. All the work is carried on efficiently to meet the target costs.

(5 marks)

Answer:

Sl. No.	Description	Recommend ABC Yes/No	Reason
(i)	K produces one product. Overhead is mainly depreciation	No	<ul style="list-style-type: none"> ● One product situation. For allocation of overhead, ABC is not required. ● ABC for cost reduction not beneficial since most of the overhead is depreciation.
(ii)	L produces 5 different products with different facilities.	Yes	<ul style="list-style-type: none"> ● Multi product situation. ABC is required for allocation of overhead. ● ABC is necessary for pricing. ● Cost drivers are likely to be different. ● Cost reduction may be possible. ● Production facilities are different.

(iii)	Professional services - lawyers/ accountants/ computer engineers	Yes	<ul style="list-style-type: none"> ● Variety of services. Hence ABC is required for cost allocation. ● Services are very different. ● ABC is necessary for pricing. ● Cost reduction possible.
(iv)	S produces 2 different labour intensive products. High unit contribution and efficient operations.	No	<ul style="list-style-type: none"> ● Different products, but labour intensive. Hence, overhead allocation based on readily traceable direct labour cost will be accurate. Hence, ABC not required for cost allocation. ● Low BEP level implies low level of fixed cost as a % of sale price or as a % of total cost. ● Many fixed cost activity drivers are likely to align with the direct labour costs. Hence not required for cost allocation. ● Efficient operation. Hence ABC not required even for cost reduction or ABC management.

2012 - May [6] (c) Classify the following items under the more appropriate category:

Category (CC) - Cost Control Or Category (CR)- Cost Reduction.

- (i) Costs exceeding budgets or standards are investigated.
- (ii) Preventive function
- (iii) Corrective function
- (iv) Measures to standardize for increasing productivity
- (v) Provision of proper storage facilities for materials.

- (vi) Continuous comparison of actual with the standards set.
 (vii) Challenges the standards set
 (viii) Value analysis (4 marks)

Answer:

Classification of items under cost reduction/cost control

Sl. No.	Item	Category Cost Control (CC) Cost Reduction (CR)
(i)	Costs exceeding budgets or standards are investigated	CC
(ii)	Preventive function	CC
(iii)	Corrective function	CR
(iv)	Measures to standardize for increasing productivity	CR
(v)	Provision of proper storage facilities for materials	CC
(vi)	Continuous comparison of actual with the standards set	CC
(vii)	Challenges the standards set	CR
(viii)	Value analysis	CR

2012 - Nov [6] (b) In the context of Activity Based Costing System, explain the following statement:

"Strategic cost analysis should exploit internal linkages." (4 marks)

Answer:

- Activity based costing is an accounting methodology that assigns cost to activities rather than to products or services.
- Activity based costing tracks the flow of activities by creating internal link between activity/ resource consumption and cost object.
- Exploiting internal linkages means taking advantage of the relationships among the activities that exist within a firm's segment of value chain.

- Activity cost and analysis are essential parts of this strategic analysis. Activities not based on production units/sales units, based on the variable activity drivers are analyzed.
- The traditional costing system is not rich enough to supply the information needed for thorough analysis of linkages.

2012 - Nov [7] Answer the following:

- (a) What is target costing? It is said that target costing fosters team work within the organisation. Explain how target costing creates an environment in which team work fosters. (4 marks)

Answer:

- Target cost is the difference between the estimated selling price of a proposed product with specified functionality and quality and 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 allocates value and cost to different attributes and quality. Therefore, they use the technique of value engineering and value analysis.
- The target cost is achieved by assigning cost reduction targets to different operations that are involved in the production process.
- Eventually, all operations do not achieve the cost reduction targets, but the overall cost reduction target is achieved through team work. Therefore, it is said that target costing fosters team work.

2012 - Nov [7] Answer the following:

- (b) What qualitative factors should be considered in an decision to out source manufacturing of a product? (4 marks)

Answer:

Qualitative Factors for outsourcing decision:

The following qualitative factors should be considered in an outsourcing decision:

- (i) Whether the vendor will acquire the technology and will emerge as a competitor?
- (ii) Whether the vendor will be able to maintain the quality? If the vendor fails to maintain the quality, will the company lose customers?

- (iii) Whether the company will lose its skills in manufacturing the product and it will find difficult to resume production internally?
- (iv) Whether laying off employees will demoralize the work force?
- (v) Whether the price quoted by the vendor is a penetrating price? If so, it is likely to increase i.e. whether price will increase.

2012 - Nov [7] Answer the following:

- (e) Brief the principles associated with synchronous manufacturing.

(4 marks)

Answer:

Please refer 2010 - May [5] (c) on page no. 26

2013 - May [7] Answer the following:

- (a) What are the focuses of Theory of Constraints? How it differs with regard to cost behaviour? (4 marks)

Answer:

Theory of Constraints:

- The theory of constraint focuses its attention on constraints and bottlenecks within the organisation which hinder speedy production.
- The main concept is to maximize the rate of manufacturing output i.e. the throughput of the organisation.
- This requires examining the **bottlenecks and constraints** which are defined as:
 - (i) A constraint is a situational factor which makes the achievement of objectives/throughput more difficult than it would otherwise be. Constraints may take several forms such as lack of skilled employees, lack of customer orders or the need to achieve a high level of quality product output.
 - (ii) A bottleneck is an activity within the organisation where the demand for that resource is more than its capacity to supply.
Therefore, a **bottleneck is always a constraint but a constraints need not be a bottleneck.**
- The theory of constraints assumes few costs are variable—generally materials, purchased parts, piecework labour and energy to run machines. It assumes that most direct labour and overheads are fixed.

- This is consistent with the idea that the shorter the time period, the more costs are fixed and the idea that the theory of constraints focuses on the short run.

2013 - Nov [2] (c) The following independent situations are given in JIT systems of production. You are required to state if each recommendation is valid or invalid and give a brief reason.

Sl. No.	Situation	Recommendation by the Cost Accountant
(i)	A company produces LCD TVs. Presently total inventory turnover is measured annually.	Compute inventory turnover every month. Break it down into raw material, WIP, expensive inventory and finished goods.
(ii)	Textile company.	Accept employees' claim for piece rate incentive for exceeding a certain production volume.
(iii)	Sports goods manufacturing company	Closely monitor direct labour variances including idle time variances to convince employees to work faster.
(iv)	Multi product production	Monitor the average set up time per machine in a period which is given by <u>Aggregate set up time of all machines</u> Total number of machines

(4 marks)

Answer :

Situation	Valid / Invalid
(i) A company produces LCD TVs. Presently total inventory turnover is measured annually	Valid- JIT system emphasize extraordinary high inventory turnover. When a company is producing LCD TVs, total turnover of inventory will be high, when the recommendation of computing of inventory turnover and breaking it into raw material, W-I-P and finished goods is given JIT system is very much valid.

(ii)	Textile company	Invalid - In textile industry, employees are paid extra if they exceed certain production volume targets. JIT focuses on producing only what is needed not to accumulate inventory on account of high incentives. So, any piece rate system must be eliminated and replaced with measures that focus instead on the quality of output or the number of employee suggestions for improving the system, which are much more important outcomes in a JIT system.
(iii)	Sports goods manufacturing company	Invalid - Monitoring Direct labour efficiency is highly inappropriate in JIT system. As JIT system unlike traditional system does not focus on fast workings of employees. Instead JIT focuses on quality of product manufactured. JIT system strives to avoid all unnecessary activities and hence eliminate non- value - added activities like monitoring direct labour variance including idle variance.
(iv)	Multi product production	Invalid -The average setup time per machine is of great importance as it can be measured periodically and plotted on a trend line. The shortest possible setup intervals are crucial for the success of short production runs, so this is a major JIT measurement. It is best to measure it by machine, rather than in the aggregate, since an aggregate measure does not reveal enough information about which equipment requires more setup time reduction work.

2013 - Nov [7] Answer the following:

(b) In Value Chain analysis, business activities are classified into primary activities and support activities. Classify the following under the more appropriate activity.

- (i) Order processing and distribution
- (ii) Installation, repair and parts replacement
- (iii) Purchase of raw material and other consumable stores
- (iv) Transforming inputs into final products
- (v) Selection, promotion, appraisal and employee relations preferential
- (vi) Material handling and warehousing
- (vii) General management, planning, finance, accounting
- (viii) Communication, pricing and channel management (4 marks)

Answer :

Activity	Primary Activity/ Support Activity
(i) Order processing and distribution	Primary Activity
(ii) Installation, repair and parts replacement	Primary Activity
(iii) Purchase of raw material and other consumable stores	Support Activity
(iv) Transforming inputs into final products	Primary Activity
(v) Selection, promotion, appraisal and employee relations	Support Activity
(vi) Material handling and warehousing	Primary Activity
(vii) General management, planning, finance, accounting	Support Activity
(viii) Communication, pricing and channel management	Primary Activity

2014 - May [7] Answer the following:

(c) Classify the following items appropriately under the three measures used in the Theory of Constraints :

- | | |
|---------|-------------------------------|
| Sl. No. | Item |
| (i) | Research and Development Cost |
| (ii) | Rent/Utilities |
| (iii) | Finished goods inventory |

- (iv) Depreciation
- (v) Labour Cost
- (vi) Stock of Raw Materials
- (vii) Sales
- (viii) Cost of equipment and buildings (4 marks)

Answer:

	Item	Theory of Constrain
1.	R&D cost	Investments
2.	Rent/Utilities	Operating cost
3.	Finished goods inventory	Investments
4.	Depreciation	Operating cost
5.	Labour cost	Operating cost
6.	Stock of RM	Investments
7.	Sales	Through put contribution
8.	Cost of equipment and buildings	Investments.

2014 - Nov [7] Answer the following:

- (c) How does the JIT approach help in improving an organization's Profitability? (4 marks)

Answer:

Just in Time: A JIT approach is a collection of ideas and philosophy that streamline a company's production process activities to such an extent that waste of all kinds, viz material and labour is systematically driven out of the process. Just in time technique enables a company to ensure that it receives products/spare parts materials from its suppliers on the exact value and date and the exact time when they are needed.

So, from an organization's perspectives JIT is beneficial the most in terms of cost, time and inventory.

So, JIT is beneficial to an organisation in the following way :

1. **Reduction in inventory cost :** Unnecessary filling up of raw material, WIP and finished goods are avoided. The focus is on production and purchase as per the organisation's requirements.

2. **Reduction in wastage of time** : Wastage of time in various ways like inspection time, machinery set up time, storage time, queue time, defectives rework time etc.
3. **Reduction in scrap rates** : There will be sharp reductions in the rates of defectives or scrapped units. The workers themselves identify defects and take prompt action to avoid their recurrence.
4. **Reduction in overhead costs** : By reducing unnecessary activities and the associated time and cost - drivers, overheads can be greatly reduced e.g. material handling rework cost, facility costs etc.
Thus, in these ways JIT is beneficial to an organization.

2014 - Nov [7] Answer the following:

- (d) Briefly explain the phases in the life cycle of a product. (4 marks)

Answer:

Phases of the product life cycle : A project consist of sequential phases. These phases are extremely useful in planning a project since they provide a framework for budgeting, manpower and resource allocation and for scheduling project milestones and project reviews, the method of division of a project into phases may differ somewhat from industry to industry and product to product.

There are four phases of product life cycle :

- Introduction/Initialisation
- Growth
- Maturity
- Saturation and Decline

Phases in Life Cycle of a Product :

Phase	Characteristics
Introduction	Product is launched. Profits are almost non-existent. Competition is almost negligible.
Growth	Sales/Profits rise rapidly. Competition enters.
Maturity	Sales increases but at a declining rate. Some firms extend their product lines with new models.
Saturation and Decline	Drop in sales volume, need for product demand disappears. Better and cheaper substitutes are available in the market.

2015 - May [7] Answer the following:

- (a) Quality products can be determined by using a few of the dimensions of quality. Identify the following under the appropriate dimension:
- Consistency of performance over time.
 - Primary product characteristics.
 - Exterior finish of a product.
 - Useful life of a product.
- (4 marks)

Answer:

Quality of Products with Appropriate Dimension

Sl. No.	Quality of Products (Examples)	Dimension
(i)	Consistency of performance over time	Reliability
(ii)	Primary product characteristics	Performance
(iii)	Exterior finish of a product	Aesthetics
(iv)	Useful like of a product	Durability

2015 - May [7] Answer the following:

- (c) Classify the following business activities into primary and support activities under value chain analysis:
- Material Handling and Warehousing.
 - Purchasing of raw materials, supplies and other consumables.
 - Order processing and distribution.
 - Selection, placement and promotion of employees.
- (4 marks)

Answer:

Classification of Business Activities into Primary and Support Activities

Sl. No.	Business Activities	Primary/ Support
(i)	Material Handling and Warehousing	Primary Activity
(ii)	Purchasing of raw materials, supplies and other consumables	Support Activity
(iii)	Order processing and distribution	Primary Activity
(iv)	Selection, placement and promotion of employees	Support Activity

2015 -Nov [7] Answer the following:

- (e) State whether and why the following statements are valid or not valid: (Statements need not be copied into answer book.)
- Target costing is not applicable to a monopoly market.
 - Target costing ignores non-value added activities.
- (4 marks)

Answer:**(i) Statement is valid.**

Reason: Target costing has been described as a process, that occurs in a competitive environment. It means in competitive environment, target costing is applicable, in monopoly market, target costing is not applicable.

(ii) Statement is valid.

Reason: The aim of target costing is to confine the total cost to set target and in order to achieve this figure, non value added activities are eliminated and hence ignored.

2016 - May [7] Answer the following question:

(d) Indicate 2 activity drivers in respect of each of the following activity cost pools:

- (i) Manufacturing cost
- (ii) Human resources cost
- (iii) Marketing and sales costs
- (iv) Accounting costs

(4 marks)

Answer:**Activity drivers:****(i) Manufacturing cost**

- No. of output produced
- No. of machine used in production.

(ii) Human resource cost

- Numbers of employees, employed and worked.
- Number of activities done by employee.

(iii) Marketing and Sales costs

- Number of units sold
- Number of places visited and number of strategy adopted.

(iv) Accounting cost

- Number of records recorded
- Number of transactions
- Number of employees employed.

2016 - Nov [7] Answer the following question:

(c) Briefly explain the principles associated with synchronous manufacturing.

(4 marks)

Answer:

Principles associated with synchronous manufacturing:

- Do not focus on balance idle capacities. Focus on synchronizing the production flow.
- Marginal value of time at a bottleneck resource = Throughput rate of the products processed by the bottleneck.
- Marginal value of time at a non-bottleneck resource is negligible.
- The level of utilization of a non-bottleneck resource is controlled by other constraints within the system.
- Resources must be utilized, not simply activated.
- A transfer batch may not, and many times should not be equal to the process batch.
- A process batch should be variable both along its route and overtime.

Note: As per synchronous manufacturing principles the return on improvements at a bottleneck resource is very high, and at a not-bottleneck resource, the return is negligible.

2017 - May [7] Answer the following question:

(c) Classify the following items under the three measures used in the theory of constraints : viz Throughput Contribution, Operating Costs and Investments.

- (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

(4 marks)

PRACTICAL QUESTIONS

2008 - Nov [3] (b) A company produces three products A, B and C. The following information is available for a period:

	A	B	C
Contribution (Rupees per unit) (Sales - Direct materials)	30	25	15

Machine hours required per unit of production:

	Hours			Throughput accounting ratio
	A	B	C	
Machine 1	10	2	4	133.33%
Machine 2	15	3	6	200%
Machine 3	5	1	2	66.67%

Estimated sales demand for A, B and C are 500 units each and machine capacity is limited to 6,000 hours for each machine.

You are required to analyse the above information and apply theory of constraints process to remove the constraints.

How many units of each product will be made? (5 marks)

Answer:

Throughput Accounting ratio is highest for 'Machine 2'

∴ 'Machine 2' is the bottleneck

Contribution per unit of bottleneck machine hour:

Total 'Machine 2' hours available = 6,000

	A	B	C
(i) Contribution per unit (₹)	30	25	15
(ii) 'Machine 2' hours	15	3	6
(iii) Contribution per 'Machine 2' hours [(i) ÷ (ii)]	2	8.33	2.50
(iv) Ranking	3	1	2
(v) Maximum Demand	500	500	500
'Machine 2' hours required [(ii) × (v)]	7,500	1,500	3,000
Units	100	500	500

2008 - Nov [6] (a) TQ Ltd. implemented a quality improvement programme and had the following results:

	2007	2008
	(Figs. In ₹ '000)	
Sales	6,000	6,000
Scrap	600	300
Rework	500	400
Production inspection	200	240
Product warranty	300	150
Quality training	75	150
Materials inspection	80	60

You are required to:

- (i) Classify the quality costs as prevention, appraisal, internal failure and external failure and express each class as a percentage of sales.
- (ii) Compute the amount of increase in profits due to quality improvement. (4 marks)

Answer:

(i) Classification of Quality Costs

Figures ₹ '000

	2007		2008	
	₹	% of sales	₹	% of sales
Sales	6,000		6,000	
Prevention				
Quality training	75	1.25	150	2.5
Appraisal				
Product Inspection	200		240	
Materials Inspection	<u>80</u>		<u>60</u>	
	280	4.67	300	5
Internal Failure				
Scrap	600		300	
Rework	<u>500</u>		<u>400</u>	
	1,100	18.33	700	11.67
External Failure				
Product warranty	300	5	150	2.5
	<u>1,755</u>	29.25	<u>1,300</u>	21.67

- (ii) Cost reduction was effected by 7.58% (29.25 - 21.67) of sales, which is an increase in profit by ₹ 4,55,000.

2009 - May [6] (c) Traditional Ltd. is a manufacturer of a range of goods. The cost structure of its different products is as follows:

Particulars	Product A	Product B	Product C
Direct materials	50	40	40 ₹/u
Direct labour @ 10 ₹/hour	30	40	50 ₹/u
Production overheads	30	40	50 ₹/u
Total Cost	110	120	140 ₹/u
Quantity produced	10,000	20,000	30,000 Units

Traditional Ltd. was absorbing overheads on the basis of direct labour hours. A newly appointed management accountant has suggested that the company should introduce ABC system and has identified cost drivers and cost pools as follows:

Activity Cost Pool	Cost Driver	Associated Cost
Stores Receiving	Purchase Requisitions	2,96,000
Inspection	Number of Production runs	8,94,000
Despatch	Orders Executed	2,10,000
Machine Setup	Number of setups	12,00,000

The following information is also supplied:

Details	Product A	Product B	Product C
No. of Setups	360	390	450
No. of Orders Executed	180	270	300
No. of Production runs	750	1,050	1,200
No. of Purchase Requisitions	300	450	500

You are required to calculate activity based production cost of all the three products. (5 marks)

Answer:

The total production overheads are ₹ 26,00,000.

Product A: $10,000 \times ₹ 30 = ₹ 3,00,000$

Product B: $20,000 \times ₹ 40 = ₹ 8,00,000$

Product C: $30,000 \times ₹ 50 = ₹ 15,00,000$

On the basis of ABC analysis this amount will be apportioned as follows:

Statement of Activity Based Production Cost

Activity Cost Pool	Cost Driver	Ratio	Total Amount (₹)	A (₹)	B (₹)	C (₹)
Stores Receiving	Purchase Requisition	6:9:10	2,96,000	71,040	1,06,560	1,18,400
Inspection	Production Runs	5:7:8	8,94,000	2,23,500	3,12,900	3,57,600
Despatch	Orders Executed	6:9:10	2,10,000	50,400	75,600	84,000
Machine Set ups	Set ups	12:13:15	12,00,000	3,60,000	3,90,000	4,50,000
Total Activity Cost				7,04,940	8,85,060	10,10,000
Quantity Sold				10,000	20,000	30,000
Unit Cost				70.49	44.25	33.67
Add: Conversion Cost				80	80	90
Total				150.49	124.25	123.67

2009 - May [7] (a) Vikram Ltd. produces 4 products using 3 different machines. Machine capacity is limited to 3,000 hours for each machine. The following information is available for February, 2009:

Products	A	B	C	D
Contribution (Sales-direct material) ₹	1,500	1,200	1,000	600
Machine Hours Required/ Unit:				
Machine 1	10	6	2	1
Machine 2	10	9	3	1.5
Machine 3	10	3	1	0.5
Estimated Demand (units)	200	200	200	200

From the above information you are required to identify the bottleneck activity and allocate the machine time. (7 marks)

Answer:

Machine	Time required for products				Total Time	Time Available	Machine utilization
	A	B	C	D			
1	2000	1200	400	200	3800	3000	126.67%
2	2000	1800	600	300	4700	3000	156.67%
3	2000	600	200	100	2900	3000	96.67%

Since Machine 2 has the highest machine Utilization it represents the bottleneck activity hence product, ranking & resource allocation should be based on contribution/machine hour of Machine 2.

Allocation of Resources

	A	B	C	D	Machine Utilization	Spare Capacity
Contribution per unit (₹)	1500	1200	1000	600		
Time required in Machine 2	10	9	3	1.5		
Contribution Per Machine- hour (₹)	150	133.33	333.33	400		
Rank as per contribution / mach. Hour	3rd	4th	2nd	1st		
Allocation of Machine 2 time	200×10 =2000	100(balancing figure)	200×3 =600	200×1.5 =300	3000	
Production Quantity	200	100/9=11.11	200	200		
Allocation Machine 1 time	2000	11.11×6 =66.66	400	200	2666.66	333.34
Allocation of Machine 3 Time	2000	11.11×3=33.33	200	100	2333.33	666.67

2009 - Nov [2] (a) A bank offers three products, viz., deposits, Loans and Credit Cards. The bank has selected 4 activities for a detailed budgeting exercise, following activity based costing methods.

The bank wants to know the product wise total cost per unit for the selected activities, so that prices may be fixed accordingly.

The following information is made available to formulate the budget :

Activity	Present cost (₹)	Estimation for the budget period
(i) ATM Services:		
(a) Machine maintenance	4,00,000	(all fixed; no change)
(b) Rents	2,00,000	(fully fixed; no change)
(c) Currency Replenishment Cost	1,00,000	(expected to double during budget period)
	<u>7,00,000</u>	(This activity is driven by no. of ATM transactions)
(ii) Computer Processing	5,00,000	(Half this amount is fixed and no change is expected) (The variable portion is expected to increase to three times the current level). This activity is driven by the number of computer transactions.
(iii) Issuing Statements	18,00,000	Presently, 3 lac statements are made. In the budget period, 5 lac statements are expected; For every increase of one lac statements, one lac rupees is the budgeted increase (this activity is driven by the number of Statements)
(iv) Customer Inquiries	2,00,000	Estimated to increase by 80% during the budget period. (This activity is driven by telephone minutes.)

The activity drivers and their budgeted quantities are given below:

	Deposits	Loans	Credit Cards
No. of ATM Transactions	1,50,000	—	50,000
No. of Computer Processing Transactions	15,00,000	2,00,000	3,00,000
No. of Statements to be issued	3,50,000	50,000	1,00,000
Telephone Minutes	3,60,000	1,80,000	1,80,000

The bank budgets a volume of 58,600 deposit accounts, 13,000 loan accounts, and 14,000 Credit Card accounts.

You are required to:

- Calculate the budgeted rate for each activity.
- Prepare the budgeted cost statement activity wise.
- Find the budgeted product cost per account for each product using (i) and (ii) above. (12 marks)

Answer:

Budget Cost Statement

Activity	Activity Cost (₹) (Budgeted)	Activity Driver	No. of Units of Activity Driver (Budget)	Activity Rate (₹)	Deposits	Loans	Credit Cards
1. ATM Services	8,00,000	ATM Transaction	2,00,000	4	6,00,000	—	2,00,000
2. Computer Processing	10,00,000	Computer Transaction	20,00,000	0.50	7,50,000	1,00,000	1,50,000
3. Issuing Statements	20,00,000	No. of Statements	5,00,000	4.00	14,00,000	2,00,000	4,00,000
4. Customer Inquiries	3,60,000	Telephone Minutes	7,20,000	0.50	1,80,000	90,000	90,000
Budgeted Cost.	41,60,000				29,30,000	3,90,000	8,40,000
Units of Product as estimated in the budget period					58,600	13,000	14,000
Budgeted Cost per unit of the product					50	30	60

Working Notes:

Activity	Budgeted Cost (₹)	Remark
ATM Services:		
(a) Machine Maintenance	4,00,000	– All fixed, no change.
(b) Rents	2,00,000	– Fully fixed, no change.
(c) Currency Replenishment Cost	<u>2,00,000</u>	– Doubled during budget period
Total	8,00,000	
Computer Processing	2,50,000	– ₹ 2,50,000 (half of ₹ 5,00,000) is fixed and no change is expected.
	7,50,000	– ₹ 2,50,000 (variable portion) is expected to increase to three times the current level.
Total	10,00,000	
Issuing Statements	18,00,000	– Existing
	2,00,000	– 2 lac statements are expected to be increased in budgeted period. For every increase of one lac statement, one lac rupees is the budgeted increase.
Total	20,00,000	
Computer Inquiries	3,60,000	– Estimated to increase by 80% during the budget period. (₹ 2,00,000 × 180%)
Total	3,60,000	

2010 - May [2] (a) AML Ltd. is engaged in production of three types of ice-cream products: Coco, Strawberry and Vanilla. The company presently sells 50,000 units of Coco @ ₹ 25 per unit, Strawberry 20,000 @ ₹ 20 per unit and Vanilla 60,000 units @ ₹ 15 per unit. The demand is sensitive to selling price and it has been observed that every reduction of ₹ 1 per unit in selling price, increases the demand for each product by 10% to the previous level. The company has the production capacity of 60,500 units of Coco, 24,200 units of Strawberry and 72,600 units of Vanilla. The company marks up 25% on cost of the product.

The Company management decides to apply ABC analysis. For this purpose it identifies four activities and the rates as follows:

Activity	Cost Rate
Ordering	₹ 800 per purchase order
Delivery	₹ 700 per delivery
Shelf stocking	₹ 199 per hour
Customer support and assistance	₹ 1.10 p.u. sold.

The other relevant information for the products are as follows:

	Coco	Strawberry	Vanilla
Direct Material p.u. (₹)	8	6	5
Direct Labour p.u. (₹)	5	4	3
No. of purchase orders	35	30	15
No. of deliveries	112	66	48
Shelf stocking hours	130	150	160

Under the traditional costing system, store support costs are charged @ 30% of prime cost. In ABC these costs are coming under customer support and assistance.

Required:

- Calculate target cost for each product after a reduction of selling price required to achieve the sales equal to the production capacity.
- Calculate the total cost and unit cost of each product at the maximum level using traditional costing.
- Calculate the total cost and unit cost of each product at the maximum level using activity based costing.
- Compare the cost of each product calculated in (i) and (ii) with (iii) and comment on it.

(12 marks)

5.40

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Answer:

(i) **Cost of products under target costing
Demedanded unit and selling price**

Coco		Strawberry		Vanilla	
Selling Price	Demand	Selling Price	Demand	Selling Price	Demand
25	50,000	20	20,000	15	60,000
24	55,000	19	22,000	14	66,000
23	60,500	18	24,200	13	72,600

Target cost of each product after reduction in selling price

	Coco	Strawberry	Vanilla
Selling price after reduction	23.00	18.00	13.00
Profit marks up 25% on cost i.e. 20% on selling price	4.60	3.60	2.60
Target cost of production (per unit)	18.40	14.40	10.40

(ii) **Cost of product under traditional costing**

	Coco	Strawberry	Vanilla
	(₹)	(₹)	(₹)
Units	60,500	24,200	72,600
Material cost (8,6,5, per unit)	8	6	5
Labour cost (5,4,3 per unit)	5	4	3
Prime cost	13	10	8
Store support costs (30% of prime)	3.90	3	2.40
Cost per unit	16.90	13.00	10.40

(iii) Cost of product under activity based costing

	Coco	Strawberry	Vanilla
	(₹)	(₹)	(₹)
Units	60,500	24,200	72,600
Material cost (8,6,5, per unit)	4,84,000	1,45,200	3,63,000
Labour cost (5,4,3 per unit)	3,02,500	96,800	2,17,800
Prime cost	7,86,500	2,42,000	5,80,800
Ordering cost @ ₹ 800 (35, 30, 15)	28,000	24,000	12,000
Delivery cost @ ₹ 700 (112, 66, 48)	78,400	46,200	33,600
Shelf stocking @ ₹ 199, (130, 150, 160)	25,870	29,850	31,840
Customer Support ₹ 1.10	66,550	26,620	79,860
Cost Per unit	16.29	15.23	10.17

(iv) Comparative Analysis of cost of production (₹)

	Coco	Strawberry	Vanilla
	(₹)	(₹)	(₹)
(a) As per Target Costing	18.40	14.40	10.40
(b) As per traditional Costing	16.90	13.00	10.40
(c) As per Activity Based Costing	16.29	15.23	10.17
(a) - (c)	2.11	-0.83	0.23
(b) - (c)	0.61	-2.23	0.23

Note: (a) The cost of product of strawberry is higher in ABC method in comparison to target costing and traditional methods. It indicated that actual profit under target costing is less than targeted. For remaining two products, ABC is most suitable.

2010 - Nov [1] {C} (d) H Ltd. manufactures three products. The material cost, selling price and bottleneck resource details per unit are as follows:

	Product X	Product Y	Product Z
Selling price (₹)	66	75	90
Material and other variable cost (₹)	24	30	40
Bottleneck resource time (minutes)	15	15	20

Budgeted factory costs for the period are ₹ 2,21,600. The bottleneck resources time available is 75120 minutes per period.

Required:

- (i) Company adopted throughput accounting and products are ranked according to 'product return per minute'. Select the highest rank product.
- (ii) Calculate throughput accounting ratio and comment on it. (5 marks)

Answer:**(i) Computation of Rank according to product return per minute**

Particulars	X	Y	Z
Selling Price	66	75	90
Variable Cost	24	30	40
Throughput Contribution	42	45	50
Minutes per unit	15	15	20
Contribution per minute	2.8	3	2.5
Ranking	II	I	III

(ii)

Particulars	X	Y	Z
Contribution/minute	2.50	3.00	2.50
Factory Cost per minute (221600/75120)	2.95	2.95	2.95
TA Ratio = Contribution per min / cost per minute	0.95	1.02	0.85
Ranking based on TA Ratio	II	I	III

Comment: Product Y yields more contribution compared to average factory contribution per minute, whereas X and Z yield less.

2010 - Nov [5] (a) Fruitolay has decided to increase the size of the store. It wants the information about the probability of the individual product lines: Lemon, grapes and papaya. It provides the following data for the 2009 for each product line:

	Lemon	Grapes	Papaya
Revenues	₹ 79,350.00	₹ 2,10,060.00	₹ 1,20,990.00
Cost of goods sold	₹ 60,000.00	₹ 1,50,000.00	₹ 90,000.00
Cost of bottles returned	₹ 1,200.00	₹ 0	₹ 0

Number of purchase orders placed	36	84	36
Number of deliveries received	30	219	66
Hours of shelf stocking time	54	540	270
Items sold	12,600	1,10,400	30,600

Fruitolay also provides the following information for the year 2009:

Sr. No.	Activity	Description of Activity	Total costs (₹)	Cost allocation basis
1.	Bottle returns	Returning of empty bottles to the store	1,200.00	Direct tracing to product line
2.	Ordering	Placing of orders of purchases	15,600.00	156 purchase orders
3.	Delivery	Physical delivery and the receipts of merchandise	25,200.00	315 deliveries
4.	Self stocking	Stocking of merchandise on store shelves and ongoing restocking	17,280.00	864 hours of time
5.	Customer support	Assistance provided to customers including bagging and checkout	30,720.00	1,53,600 items sold

Required:

- Fruitolay currently allocates store support costs (all costs other than the cost of goods sold) to the product line on the basis of the cost of goods sold of each product line. Calculate the operating income and operating income as the percentage of revenue of each product line.
- If Fruitolay allocates store support costs (all costs other than the cost of goods sold) to the product lines on the basis of ABC system, calculate the operating income and operating income as the percentage of revenue of each product line.
- Compare both the systems. (11 marks)

Answer:

(i) Traditional Costing System

Particulars	Lemon	Grapes	Papaya	Total
Revenue	79,350	2,10,060	1,20,990	4,10,400
Less: Cost of goods sold (COGS)	60,000	1,50,000	90,000	3,00,000
Less: Store Support Cost	18,000	45,000	27,000	90,000
Operating income	1,350	15,060	3,990	20,400
Operating Income %	1.70%	7.17%	3.30%	4.97%

(ii) ABC System Overhead Allocation Rate

Activity	Cost Heirarchy Level	Total Costs (₹)	Quantity of Cost Allocation Base	Overhead Allocation Rate
Ordering	Batch	15600	156 Purchase orders	₹ 100
Delivery self	Batch	25200	315 delivering orders	₹ 80
Stocking	Output unit	17280	864 self stocking hours	₹ 20
Customer Support	Output unit	30720	153600 items sold	₹ 0.20

Store Support Cost

Particulars	Cost Driver	Lemon	Grapes	Papaya	Total
Bottle Returns	Direct	1200	0	0	1200
Ordering	Purchase orders	3600	8400	3600	15600
Delivery	Deliveries	2400	17520	5280	25200
Self Stocking	Hours of time	1080	10800	5400	17280
Customer Support	Items Sold	2520	22080	6120	30720
Grand Total		10800	58800	20400	90000

Operating Income

Particulars	Lemon	Grapes	Papaya	Total
Revenue	79350	210060	120990	410400
Less: Cost of goods sold	60000	150000	90000	300000
Less: Store Support Cost	10800	58800	20400	90000
Operating income	8550	1260	10590	20400
Operating income %	10.78%	0.60%	8.75%	4.97%

Summary/ Comparison

Particulars	Lemon	Grapes	Papaya	Total
Under Traditional Costing System	1.70%	7.17%	3.30%	4.97%
Under ABC System	10.78%	0.60%	8.75%	4.97%

The grapes line drops sizeably when ABC is used. Although it constitutes 50% COGS, it uses a higher percentage of total resources in each activity area, especially the high cost of customer support area. In contrast, lemon line draws a much lower percentage of total resources used in each activity area than its percentage of total COGS. Hence under ABC, Lemon is most profitable. Fruitlay can explore ways to increase sales of lemons and also explore price increases on grapes.

Operating Income Ranking is highest for Grapes under Traditional System because other products bear its overhead cost, whereas under ABC a more accurate picture shows Grapes as the lowest ranking product

2011 - May [1] {C} (b) A company makes a single product which sells at ₹ 800 per unit and whose variable cost of production is ₹ 500 per unit. Production and sales are 1000 units per month. Production is running to full capacity and there is market enough to absorb an additional 20% of output each month.

The company has two options:

Option -I

Inspect finished goods at ₹ 10,000 per month. 4% of production is detected as defectives and scrapped at no value. There will be no warranty replacement, since every defect is detected. A small spare part which wears out due to defective material is required to be replaced at ₹ 2,000 per spare for every 20 units of scrap generated. This repair cost is not included in the manufacturing cost mentioned above.

Option -II

Shift the finished goods inspection at no extra cost, to raw material inspection, (since defective raw materials are entitled to free replacement by the supplier), take up machine set-up tuning and machine inspection at an additional cost of ₹ 8,000 per month, so that scrap of finished goods is completely eliminated. However, delivery of uninspected finished products may result in 1% of the quantity sold to be replaced under free warranty due to minor variation in

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dimensions, which does not result in the wearing out of the spare as stated in Option -I.

- (i) Using monthly figures relevant for decision making, advise which option is more beneficial to the company from a financial perspective.
- (ii) Identify the quality costs that can be classified as
- appraisal costs and
 - external failure costs. (5 marks)

Answer:

	Option I		Option II	
Production	1000 Units		1000 Units	
Finished Goods Inspection	10000	Appraisal	-	
Raw Material Inspection scrap 4% = 40 units x variable cost per unit 500	20000	Appraisal	10000	
Contribution lost 300 x 40	12000	Appraisal		
Machine repair	4000	Appraisal	-	
Machine set up			8000	
Warranty replacement	-			
1% x 1000 = 10 unit				
Contribution lost 10 x 300			3000	External failure
Variable Cost lost 10 x 500			5000	External failure
Quality Cost	46000		26000	

Better Option II

2011 - May [2] (a) During the last 20 years, KL Ltd.'s manufacturing operation has become increasingly automated with computer-controlled robots replacing operators. KL currently manufactures over 100 products of varying levels of design complexity. A single plant wise overhead absorption rate, based on direct labour hours is used to absorb overhead costs.

In the quarter ended March, KL's manufacturing overhead costs were:

	(₹ '000)
Equipment operation expenses	125

Equipment maintenance expenses	25
Wages paid to technicians	85
Wages paid to component stores staff	35
Wages paid to despatch staff	<u>40</u>
Total	<u>310</u>

During the quarter, the company reviewed the Cost Accounting System and concluded that absorbing overhead costs to individual products on a labour hour absorption basis was meaningless and that overhead costs should be attributed to products using an Activity Based Costing (ABC) system. The following are identified as the most significant activities:

- (i) Receiving component consignments from suppliers.
- (ii) Setting up equipment for production runs
- (iii) Quality inspections
- (iv) Despatching goods as per customers' orders.

Equipment operation and maintenance expenses are apportioned as:

- Component stores 15%, production runs 70% and despatch 15%
- Technicians' wages are apportioned as:
- Equipment maintenance 30%, set up equipment for production runs 40% and quality inspections 30%.

During the quarter:

- (i) 980 component consignments were received from suppliers.
- (ii) 1020 production runs were set up
- (iii) 640 quality inspections were carried out.
- (iv) 420 orders were despatched to customers.

KL's production during the quarter included component R. The following information is available.

	Component R
Component Consignments received	45
Production runs	16
Quality Inspections	10
Orders (goods) despatched	22
Quantity produced	560

Calculate the unit manufacturing overhead cost of component R using ABC system. (8 marks)

Answer:

Particulars	Receiving Supplies (₹ 000)	Set ups (₹ 000)	Quality Inspection (₹ 000)	Despatch (₹ 000)	Total (₹ 000)
Equipment Operation Expenses	18.75	87.5		18.75	125
Maintenance technicians wages initially allocated to maintenance (30% of ₹ 85,000 = ₹ 25,500 & then	3.75	17.5		3.75	25
Reallocated on the same basis on maintenance	3.83	17.85		3.82	25.5
Balance of technician wages, allocated to set ups and quality inspections		34	25.5		59.5
Stores wages - Receiving	35				35
Despatch wages - Despatch				40	40
	61.33	156.85	25.5	66.32	310

Note: Equipment operations expenses and Maintenance allocated on the basis 15% 70%, and 15% as per the information given in the question.

The next step is to identify cost drivers for each activity and established cost driver rates by dividing the activity costs by a measure of cost driver usage for the period. The calculations are as follows.

Receiving supplies (₹ 61,330/980) = ₹ 62.58 per component

Performing set ups (₹ 1,56,850/1020) = ₹ 153.77 per set up

Despatching goods (₹ 66,320/420) = ₹ 157.93 per goods order despatched

Quality Inspection (₹ 25,500/640) = ₹ 39.84

At last the costs are assigned to components based on their cost driver usage. The assignments are as follows.

Particulars	(₹)
Direct Labour	300
Direct Materials	1200
Receiving supplies	2816.1
Performing Set up	2460.32
Quality Inspection	398.4
Despatching goods	<u>3474.46</u>

Total Cost	10649.28
	(₹)
No. of units produced	560
Cost per unit	16.34

For components the overhead costs have been assigned as follows (for components R)

Receiving supplies	(45 receipts at ₹ 62.58)
Performing setups	(16 production runs at ₹ 153.77)
Quality Inspections	(10 at ₹ 39.84)
Despatching goods	(22 at ₹ 157.90)

2011 - May [4] Answer the following:

- (a) 6000 pen drives of 2 GB are to be sold in a perfectly competitive market to earn ₹ 1,06,000 profit, whereas in a monopoly market only 1200 units are required to be sold to earn the same profit. The fixed costs for the period are ₹ 74,000. The contribution per unit in the monopoly market is as high as three fourths its variable cost. Determine the target selling price per unit under each market condition. (4 marks)

Answer:

Particulars	Perfect Competition	Monopoly
Units	6,000	1,200
Contribution (1,06,000 + 74,000)	1,80,000	1,80,000
Contribution per unit	30	150
Variable Cost per unit $150 \div \frac{3}{4}$		
Variable Cost per unit	200	200
Selling Price per unit	230	350

2011 - Nov [3] (a) PQ Ltd. makes two products P and Q, which are similar products with slight difference in dimensions, but use the same manufacturing processes and facilities. Production may be made interchangeably after altering machine setup. Production time is the same for both products. The cost structure is as follows:

(Figures ₹ per unit)	<u>P</u>	<u>Q</u>
Selling Price	100	120

Variable manufacturing cost (directly linked to units produced)	45	50
Contribution	55	70
Fixed manufacturing cost	10	10
Profit	45	60

Fixed cost per unit has been calculated based on the total practical capacity of 20,000 units per annum (which is either P or Q or both put together). Market demand is expected to be the deciding factor regarding the product mix for the next 2 years. The company does not stock inventory of finished goods. The company wishes to know whether ABC system is to be set up at a cost of ₹ 10,000 per month for the purpose of tracking and recording the fixed overhead costs for allocation to products.

Support your advice with appropriate reasons. (6 marks)

Independent of the above, if you are told to assume that fixed costs stated above, consist of a non-cash component of depreciation to plant at ₹ 90,000 for the year, will your advice change? Explain. (2 marks)

Answer:

	Data	Reasoning	Decision
(i)	Similar Products, Similar Production Resources	OH Cost based on production units is appropriate. ABC will also yield identical results	ABC system not required for OH allocation
(ii)	Present OH Cost = ₹ 10/u. Proposed Increase due to ABC system: $120000 / 20000 = ₹ 6/u$	Current OH cost of ₹ 10/u will increase by ₹ 6 per unit due to installing ABC system (60% increase)	For allocation purpose, ABC not justified
(iii)	Both have positive contribution/u. Market demand determines the mix	OH allocation has no role in decision making	No need for ABC System
(iv)	For the purpose of OH allocation, ABC need not be installed. However, if the fixed overheads of ₹ 2,00,000 are analysed by activity and thereby a saving of at least ₹ 1,20,000 be expected (which is the cost of installing ABC system), then, ABC system may be installed		

- (v) For the non cash component of depn. = ₹ 90,000, FC that can be saved is a maximum of ₹ 1,10,000 (₹ 2,00,000 – ₹ 90,000).
Hence, this is clearly less than ABC cost installation. Hence do not install ABC System

2013 - May [2] (a) DEF Bank operated for years under the assumption that profitability can be increased by increasing Rupee volumes. But that has not been the case. Cost Analysis has revealed the following:

Activity	Activity Cost (₹)	Activity Driver	Activity Capacity
Providing ATM service	1,00,000	No. of transactions	2,00,000
Computer processing	10,00,000	No. of transactions	25,00,000
Issuing Statements	8,00,000	No. of statements	5,00,000
Customer inquiries	3,60,000	Telephone minutes	6,00,000

The following annual information on three products was also made available:

	Checking Accounts	Personal Loans	Gold Visa
Units of product	30,000	5,000	10,000
ATM transactions	1,80,000	0	20,000
Computer transactions	20,00,000	2,00,000	3,00,000
Number of statements	3,00,000	50,000	1,50,000
Telephone minutes	3,50,000	90,000	1,60,000

Required:

- Calculate rates for each activity.
- Using the rates computed in requirement (i), calculate the cost of each product. (8 marks)

Answer:

Computation showing Rates for each Activity

Activity	Activity Cost [a] (₹'000)	Activity Driver	No. of Units of Activity Diver [b] (₹'000)	Activity Rate [a]/[b] (₹)
Providing ATM Service	1,00	No. of ATM Transactions	2,00	0.50
Computer Processing	10,00	No. of Computer Transactions	25,00	0.40
Issuing Statements	8,00	No. of Statements	5,00	1.60
Customer Inquiries	3,60	Telephone Minutes	6,00	0.60

Computation showing Cost of each Product

Activity	Checking Accounts (₹)	Personal Loans (₹)	Gold Visa (₹)
Providing ATM Service	90,000 (1,80,000 tr. x ₹ 0.50)	-	10,000 (20,000 tr. x ₹ 0.50)
Computer Processing	8,00,000 (20,00,000 tr. x ₹ 0.40)	80,000 (2,00,000 tr. x ₹ 0.40)	1,20,000 (3,00,000 tr. x ₹ 0.40)
Issuing Statements	4,80,000 (3,00,000 tr. x ₹ 1.60)	80,000 (50,000 tr. x ₹ 1.60)	2,40,000 (1,50,000 tr. x ₹ 1.60)
Customer Inquiries	2,10,000 (3,50,000 tr. x ₹ 0.60)	54,000 (90,000 tr. x ₹ 0.60)	96,000 (1,60,000 tr. x ₹ 0.60)
Total Cost [a]	₹ 15,80,000	₹ 2,14,000	₹ 4,66,000
Units of Product [b]	30,000	5,000	10,000
Cost of each Product [a]/[b]	52.67	42.80	46.60

2013 - May [4] (b) Gupta Ltd. produces 4 products P, Q, R and S by using three different machines X, Y and Z. Each machine capacity is limited to 6000 hours per month. The details given below are for July, 2013:

	P	Q	R	S
Selling price p.u.(₹)	10,000	8,000	6,000	4,000
Variable cost p.u. (₹)	7,000	5,600	4,000	2,800
Machine hours required p.u.				
Machine X	20	12	4	2
Machine Y	20	18	6	3

Machine Z	20	6	2	1
Expected Demand (units)	200	200	200	200

Required:

- (i) Find out the bottleneck activity.
- (ii) Allocate the machine hours on the basis of the bottleneck.
- (iii) Ascertain the profit expected in the month if the monthly fixed cost amounts to ₹ 9,50,000.
- (iv) Calculate the unused spare hours of each machine. (8 marks)

Answer:

(i) Computation of Machine Utilisation:

Machine	Time Required for Products (Hours)				Total Time	Time Available	Machine Utilization
	P	Q	R	S			
X	4,000 (200 units x 20 hours)	2,400 (200 units x 12 hours)	800 (200 units x 4 hours)	400 (200 units x 2 hours)	7,600	6,000	126.67%
Y	4,000 (200 units x 20 hours)	3,600 (200 units x 18 hours)	1,200 (200 units x 6 hours)	600 (200 units x 3 hours)	9,400	6,000	156.67%
Z	4,000 (200 units x 20 hours)	1,200 (200 units x 6 hours)	400 (200 units x 2 hours)	200 (200 units x 1 hours)	5,800	6,000	96.67%

Because of Machine Y has the highest machine utilization it represents the bottleneck activity.

Therefore Product Ranking & Resource Allocation should be based on Contribution / Machine Hour of Machine Y.

(ii) Allocation of Resources:

Particulars	P	Q	R	S	Machine Utilization	Spare capacity
Selling Price per unit (₹)	10,000	8,000	6,000	4,000		
Variable Cost per unit (₹)	7,000	5,600	4,000	2,800		
Contribution per unit (₹)	3,000	2,400	2,000	1,200		
Time Required in Machine 'Y' (hrs.)	20	18	6	3		

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Contribution per Machine Hour (₹) Rank	150 III	133.33 IV	333.33 II	400 I		
Allocation of Machine time (hrs.)	4,000 (200 units × 20 hrs.)	200 (Balance)	1,200 (200 units × 6 hrs.)	600 (200 units × 3 hrs.)	6,000	
Production (units)	200	11.11 (200 hrs./18 hrs.)	200	200		
Allocation of Machine 'X' time (hrs.)	4,000 (200 units × 20 hrs.)	133.32 (11.11 units × 12 hrs.)	800 (200 units × 4 hrs.)	400 (200 units × 2 hrs.)	5,333.32	666.68
Allocation of Machine 'z' time (hrs.)	4,000 (200 units × 20 hrs.)	66.66 (11.11 units × 6 hrs.)	400 (200 units × 2 hrs.)	200 (200 units × 1 hrs.)	4,666.66	1,333.34

(iii) Calculation of Expected Profit

Particulars	Amount (₹)
P (200 units × ₹ 3,000)	6,00,000
Q (11.11 units × ₹ 2,400)	26,664
R (200 units × ₹ 2,000)	4,00,000
S (200 units × ₹ 1,200)	2,40,000
Total Contribution	12,66,664
Less: Fixed Cost	9,50,000
Expected Profit	3,16,664

(iv) Unused Spare Hours

Machine 'X'

Particulars	Amount (₹)
Machine Hours Available	6,000.00 hrs.
Less: Machine Hours Utilized	5,333.32 hrs.
Spare Hours	666.68 hrs.

Machine 'Z'

Particulars	Amount (₹)
Machine Hours Available	6,000.00 hrs.
Less: Machine Hours Utilized	4,666.66 hrs.
Spare Hours	1,333.34 hrs.

Note: At the time of computation of Production (units) of Product 'Q' on the basis of allocated hours, round figure (complete units) can also be considered. Then remaining solution will be changed accordingly.

2013 - Nov [6] (a) MK Ltd. manufactures four products, namely A, B, C and D using the same plant and process. The following information relates to a production period:

Product	A	B	C	D
Output in Units	720	600	480	504

The four products are similar and are usually produced in production runs of 24 units and sold in batches of 12 units. The total overheads incurred by the company for the period are as follows:

	₹
Machine operation and maintenance cost	63,000
Setup costs	20,000
Store receiving	15,000
Inspection	10,000
Material handling and dispatch	2,592

During the period the following cost drivers are to be used for the overhead cost:

Cost	Cost driver
Setup cost	No. of production runs
Store receiving	Requisitions raised
Inspection	No. of production runs
Material handling and dispatch	Orders executed

It is also determined that:

- Machine operation and maintenance cost should be apportioned between setup cost, store receiving and inspection activity in the ratio 4 : 3 : 2.

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- Number of requisition raised on store is 50 for each product and the no. of orders executed is 192, each order being for a batch of 12 units of a product.

Calculate the total overhead cost per unit of each product using activity based costing after finding activity wise overheads allocated to each product.

(8 marks)

Answer:**1. Computation of ABC Recovery Rates**

Activity	Activity Cost Pool	Cost Driver	Quantity	ABC Rate
Set Up	20,000 + 28,000 = ₹ 48,000	No. of Production Runs	96	₹ 500 per Run
Stores Receiving	15,000 + 21,000 = ₹ 36,000	Requisitions raised	50 × 4 = 200	₹ 180 per Reqn.
Inspection	10,000 + 14,000 = ₹ 24,000	No. of Production Runs	96	₹ 250 per Run
Material Handling	Given = ₹ 2,592	Orders executed	192	₹ 13.5 per Batch

Note:

- Machine Operation and Maintenance Cost of ₹ 63,000 is apportioned to the first three activities in the ratio 4:3:2, i.e. ₹ 28,000, ₹ 21,000 and ₹ 14,000
- Number of Production Runs and Number of Batches are computed as under:

Product	A	B	C	D	Total
(a) Output Quantity	720 units	600 units	480 units	504 units	
(b) Quantity per Production Run	24 units	24 units	24 units	24 units	
(c) Number of Production Runs (a ÷ b)	30 runs	25 runs	20 runs	21 runs	96 runs
(d) Quantity per Batch Order	12 units	12 units	12 units	12 units	
(e) Number of Batches (a ÷ b)	60 batches	50 batches	40 batches	42 batches	192 batches

2. Computation of OH Costs using ABC System

Product	A	B	C	D	Total
• Set up	500 × 30 = ₹ 15,000	500 × 25 = ₹ 12,500	500 × 20 = ₹ 10,000	500 × 21 = ₹ 10,500	₹ 48,000
• Stores Receiving	₹ 9,000	₹ 9,000	₹ 9,000	₹ 9,000	₹ 36,000
• Inspection	250 × 30 = ₹ 7,500	250 × 25 = ₹ 6,250	250 × 20 = ₹ 5,000	250 × 21 = ₹ 5,250	₹ 24,000
• Material Handling	13.50 × 60 = ₹ 810	13.50 × 50 = ₹ 675	13.50 × 40 = ₹ 540	13.50 × 42 = ₹ 567	₹ 2,592
(a) Total OH Cost	₹ 32,310	₹ 28,425	₹ 24,540	₹ 25,317	₹ 1,10,592
(b) Output Quantity	720 units	600 units	480 units	504 units	
(c) OH Cost p.u.	₹ 44.875	₹ 47.375	₹ 51.125	₹ 50.232	

2014 - May [1] {C} (c) A Ltd. is going to introduce Total Quality Management (TQM) in its company. State whether and why the following are valid or not for the successful implementation of TQM.

- Some departments serve both the external and internal customers. These departments have been advised to focus on satisfying the needs of the external customers.
- Hold a training program at the beginning of a production cycle to ensure the implementation of TQM.
- Implement Management by Objectives for faster achievement of TQM.
- Appoint the Head of each department as the person responsible to develop improvement strategies and performance measures.
- Eliminate wastage of time by avoiding documentation and procedures.

(5 marks)

Answer:

Total Quality Management :

- Invalid :** TQM advocates focus to be given on both external and internal customers. Hence, focus satisfying the needs of the external customers only will not be valid for the successful implementation of TQM.
- Valid:** Hold a training program at the beginning of the production cycle is necessary for effectiveness and accuracy of process.
- Invalid:** For implementation of TQM, Management by Objectives should be eliminated as targets of production will encourage delivery of poor quality goods and thus will defeat the collective nature of TQM.

- (iv) **Invalid:** For achievement of goals each and every person of organisation is responsible, not a single person. So all persons of organisation make a group efforts for success. So appointment of head of each department is not necessary.
- (v) **Invalid:** Documentation, procedures and awareness of current best practice are essential in TQM implementation. If documentation and procedures are in place then only improvement can be monitored & measured and consequently deficiency can be corrected.

2014 - May [4] (a) PQR Ltd. specializes in the distribution of pharmaceutical products. It buys from pharmaceutical companies and resells to each of the three different markets:

- (i) General Supermarket chains
- (ii) Drug Store chains
- (iii) Chemist shops

The company plans to use activity based costing for analyzing the profitability of its distribution channels. The following data for the quarter ending March 2014 is given:

	General supermarket chains	Drug store chains	Chemist shops
Average sales per delivery	₹ 96,500	₹ 32,450	₹ 6,225
Average cost of goods sold per delivery	₹ 94,650	₹ 31,800	₹ 5,950
Number of deliveries	960	2,470	8,570
Total number of orders	1,000	2,650	9,500
Average number of cartons shipped per delivery	250	75	12
Average number of hours of shelf stocking per delivery	2	0.5	0.1

The following information is available in respect of operating costs (other than cost of goods sold) for the quarter ending March 2014:

Activity Area	Cost driver	Total cost (₹)
Customer purchase order processing	Purchase order by customers	5,91,750
Customer store delivery	Number of deliveries	9,60,000
Cartons dispatched to customer stores	Number of Cartons dispatched to customer stores	7,92,135
Shelf stocking at customer store	Hours of shelf stocking	80,240

Compute the operating income of each distribution channel for the quarter ending March 2014 using activity based costing. (8 marks)

Answer:

Statement showing operating Income of Distribution Channels of PQR Ltd.

Particulars	General Supermarket Chains (₹)	Drug Store Chains (₹)	Chemist Shops (₹)	Total (₹)
Sales (Number of Deliveries × Average Sales per delivery)	9,26,40,000 (960 × ₹96,500)	8,01,51,500 (2,470 × ₹ 32,450)	5,33,48,250 (8,570 × ₹ 6,225)	22,61,39,750
Less: Cost of Goods Sold (Number of Deliveries × Average Cost of Goods Sold per delivery)	9,08,64,000 (960 × ₹94,650)	7,85,46,000 (2,470 × ₹31,800)	5,09,91,500 (8,570 × ₹5,950)	22,04,01,500
Gross Margin	17,76,000	16,05,500	23,56,750	57,38,250
Less: Operating Costs	5,20,200	6,19,425	12,84,500	24,24,125
Operating Income	12,55,800	9,86,075	10,72,250	33,14,125

Workings Notes:**Statement Showing Operating Cost of
Distribution Channels of PQR Ltd.**

Particulars	General Supermarket Chains (₹)	Drug Store Chains (₹)	Chemist Shops (₹)	Total (₹)
Customer Purchase Order Processing	45,000 (₹45 × 1,000)	1,19,250 (₹45 × 2,650)	4,27,500 (₹45 × 9,500)	5,91,750
Customer Store Delivery	76,800 (₹ 80 × 960)	1,97,600 (₹80 × 2,470)	6,85,600 (₹80 × 8,570)	9,60,000
Cartons Dispatched to Customer Stores	3,60,000 (₹1.5 × 2,40,000)	2,77,875 (₹1.5 × 1,85,250)	1,54,260 (₹1.5 × 1,02,840)	7,92,135
Shelf Stocking at Customer Store	38,400 (₹ 20 × 1,920)	24,700 (₹ 20 × 1,235)	17,140 (₹ 20 × 857)	80,240
	5,20,200	6,19,425	12,84,500	24,24,125

Computation of Rate Per Unit of Cost Allocation Base

Activity	Activity Cost [a] (₹)	Activity Driver	No. of Units of Activity Drive [b]	Cost Driver Rate [a]/[b] (₹)
Customer Purchase Order Processing	5,91,750	Purchase Order by Customers	13,150	45.00
Customer Store Delivery	9,60,000	Number of Deliveries	12,000	80.00
Cartons Dispatched to Customer Stores	7,92,135	Number of Cartons Dispatched to Customer Stores	5,28,090	1.50
Shelf Stocking at Customer Store	80,240	Hours of Shelf Stocking	4,012	20.00

No. of Units of Activity Driver:

Purchase Order by Customers

$$= 1,000 + 2,650 + 9,500$$

$$= 13,150$$

Number of Deliveries

$$= 960 + 2,470 + 8,570$$

$$= 12,000$$

Number of Cartons Dispatched
to Customer Stores = Number of Deliveries × Average Number of
Cartons Shipped per delivery

$$= (960 \times 250) + (2,470 \times 75) + (8,570 \times 12)$$

$$= 2,40,000 + 1,85,250 + 1,02,840$$

$$= 5,28,090$$

Hours of Shelf Stocking = Number of Deliveries × Average Number of
Hours of Shelf Stocking per delivery

$$= (960 \times 2.0) + (2,470 \times 0.5) + (8,570 \times 0.1)$$

$$= 1,920 + 1,235 + 857$$

$$= 4,012$$

2014 - Nov [6] (a) A company manufactures several products of varying designs and models. It uses a single overhead recovery rate based on direct labour hours. The overheads incurred by the Company in the first half of the year are as under:

	₹
Machine operation expenses	20,25,000
Machine maintenance expenses	3,75,000
Salaries of technical staff	12,75,000
Wages and salaries of stores staff	5,25,000

During this period, the company introduced activity based costing system and the following significant activities were identified:

- Receiving materials and components
- Set up of machines for production runs
- Quality inspection

It is also determined that:

- The machine operation and machine maintenance expenses should be apportioned between stores and production activity in 1:4 ratio.
- The technical staff salaries should be apportioned between machine maintenance, set up and quality inspection in 3 : 4 : 3 ratio.

The consumption of activities during the period under review are as under:

• Direct labour hours worked	80,000
• Production set-ups	4,080
• Material and components consignments received from suppliers	3,920
• Number of quality inspection carried out	2,560

The direct wages rate is ₹ 12 per hour.

The data relating to two products manufactured by the company during the period are as under:

		P	Q
Direct Materials costs	₹	12,000	8,000
Direct labour hours	Hrs.	960	100
Direct Materials Consignments received	nos.	48	52
Production runs	nos.	36	24
Number of quality inspection done	nos.	30	10
Quantity Produced	Unit in nos.	15,000	5,000

A potential customer has approached the company for the supply of 24,000 units of a component 'R' to be delivered in lots of 3000 units per quarter. The job will involve an initial design cost of ₹ 60,000 and the manufacture will involve the following per quarter.

Direct Material costs	₹	12,000
Direct labour hours	Hrs.	300
Production runs	nos.	6
Inspections	nos.	24
Number of consignments of direct materials to be received	nos.	20

You are required to

1. Calculate the cost of products P and Q based on the existing system of single overhead Recovery rate.
2. Determine the cost of products P & Q using Activity Based Costing system.
3. Compute the sales values per quarter of components 'R' using Activity Based Costing system. (considering a mark up of 25% on cost)

(10 marks)

Answer:

1. Statement of Computation of Unit Cost of Product P & Q on the Existing System

Particulars	P (₹)	Q (₹)
Direct Material	12,000	8,000
Direct Labour Cost	11,520 (₹ 12 × 960 hr.)	1,200 (₹ 12 × 100 hr.)
Overheads (Direct Labour Hours × ₹ 52.5 per hour)	50,400	5,250

Total Cost	73,920	14,450
Quantity Produced (units)	15,000	5,000
Cost per unit	4.928	2.89

Single Factory Direct Labour Hour Overhead Rate

$$= \frac{\text{₹42,00,000}}{\text{80,000 labour hours}}$$

$$= \text{₹ 52.50 per Direct Labour Hour}$$

2. Workings

Apportionment of Overheads (Amount in ₹)

Particulars	Receiving Supplies	Setups	Quality Inspection	Total
Machine Operation Expenses (1 : 4)	4,05,000 $\left(\text{₹20,25,000} \times \frac{1}{5} \right)$	16,20,000 $\left(\text{₹20,25,000} \times \frac{4}{5} \right)$	—	20,25,000
Maintenance (1 : 4)	1,51,500 $\left(\text{₹7,57,500} \times \frac{1}{5} \right)$	6,06,000 $\left(\text{₹7,57,500} \times \frac{4}{5} \right)$	—	7,57,500 (1)
Salary of Technical Staff	—	5,10,000 $\left(\text{₹12,75,000} \times \frac{4}{10} \right)$	3,82,500 $\left(\text{₹12,75,000} \times \frac{3}{10} \right)$	8,92,500 (2)
Wages & Salary of Stores Staff	5,25,000	—	—	5,25,000
Total	10,81,500	27,36,000	3,82,500	42,00,000

(1) ₹ 3,75,000 + Share of Technician's Salary $\left(\text{₹12,75,000} \times \frac{3}{10} \right)$

(2) ₹ 12,75,000 - Share to Machine Maintenance $\left(\text{₹12,75,000} \times \frac{3}{10} \right)$

To identify the cost drivers for each activity and establish cost driver rates by dividing the activity costs by a measure of cost driver usage for the period.

Calculation of Activities Cost Driver Rate

Overheads	Activity Cost Driver Rate
Receiving Supplies $\left[\frac{\text{₹10,81,500}}{3,920} \right]$	₹ 275.89 Per consignment
Performing Setups $\left[\frac{\text{₹27,36,000}}{4,080} \right]$	₹ 670.59 per setup
Quantity Inspection $\left[\frac{\text{₹3,82,500}}{2,560} \right]$	₹ 149.41 per quality inspection

Thus, costs are assigned to components based on their cost driver usage. The assignments are as follows:

**Statement of Determination of the Cost of Product P & Q using
Activity Based Costing System**

Particulars	P (₹)	Q (₹)
Direct Materials	12,000	8,000
Direct Labour @ ₹ 12 per hour	11,520	1,200
Receiving Supplies	13,243 (₹ 275.89 × 48 Con.)	14,346 (₹ 275.89 × 52 Con.)
Performing Setups	24,141 (₹ 670.59 × 36 Set-ups)	16,094 (₹ 670.59 × 24 Set-ups)
Quality Inspections	4,482 (₹ 149.41 × 30QI)	1,494 (₹ 149.41 × 10 QI)
Total Costs	65,386	41,134
No. of Units Produced	15,000	5,000
Cost Per Unit	4.36	8.23

3. Calculation of Sales Value per Quarter of Component 'R' (using ABC)

Particulars of Costs	Amount (₹)
Direct Materials	12,000
Direct Labour (@ ₹ 12 per hour)	3,600 (₹ 12 × 300 Hr.)
Initial Design Cost (₹ 60,000 ÷ 8 Quarter)	7,500
Receiving Supplies	5,518 (₹ 275.89 × 20 Con.)
Performing Setups	4,024 (₹ 670.59 × 6 Set-ups)
Quality Inspections	3,586 (₹ 149.41 × 24 QI)
Total Costs	36,228
Add: Margin 25% of ₹ 36,228	9,057
Total Sales Value	45,285

2015 - May [4] (a) Genex Limited produces 3 products X, Y and Z using three different machines M_1 , M_2 and M_3 . Each machine's capacity is limited to 6000 hours during the production period. The details given below are for the production period:

Particulars	X	Y	Z
Selling price per unit	₹ 12,000	₹ 10,000	₹ 8,000
Variable cost per unit	₹ 8,000	₹ 6,800	₹ 6,000
Machine Hours required per unit:			
M_1	18	12	6
M_2	18	16	8
M_3	20	8	2
Expected Demand (units)	200	200	200

- Determine the bottleneck activity.
- Allocate the machine hours on the basis of the bottleneck.
- Determine the unused spare capacity, if any, of each machine.

(8 marks)

Answer:**(i) Calculation of Bottleneck Activity**

Particulars	Products			
	X	Y	Z	Total
Demand	200	200	200	600
Machine Hours				
M_1	3600	2400	1200	7200
M_2	3600	3200	1600	8400
M_3	4000	1600	400	6000

Bottleneck activity is machine hours of machine M_2 .

(ii) Allocation of Machine Hours on the basis of Bottleneck Activity:**Ranking**

	Product X	Product Y	Product Z
Contribution p.u.	4000	3200	2000
Machine Hrs. M_2	18	16	8
Contribution p.u. per Machine Hr.	222.22	200	250
Ranking	II	III	I

Allocation of Hrs.**Particulars**

	Products		
	X	Y	Z
Units	200	50 = $\frac{800}{16}$	200

Machine Hrs.

M ₁	3600	600	1200
M ₂	3600	800	1600
M ₃	4000	400	400

(iii) Calculation of unused capacity of each machine

Machine	Unused capacity
M ₁	6000 - 3600 - 600 - 1200 = 600 hrs.
M ₂	6000 - 3600 - 800 - 1600 = Nil
M ₃	6000 - 4000 - 400 - 400 = 1200 hrs.

2015 - May [5] (a) Linex Limited manufactures three products P, Q and R which are similar in nature and are usually produced in production runs of 100 units. Product P and R require both machine hours and assembly hours, whereas product Q requires only machine hours. The overheads incurred by the company during the first quarter are as under:

	₹
Machine Department expenses	18,48,000
Assembly Department expenses	6,72,000
Setup costs	90,000
Stores receiving cost	1,20,000
Order processing and dispatch	1,80,000
Inspection and Quality control cost	36,000

The data related to the three products during the period are as under:

	P	Q	R
Units produced and sold	15000	12000	18000
Machine hours worked	30000 hrs	48000 hrs	54000 hrs
Assembly hours worked (direct labour hours)	15000 hrs	-	27000 hrs

Customers orders executed (in numbers)	1250	1000	1500
Number of requisitions raised on the stores.	40	30	50

Prepare a statement showing details of overhead costs allocated to each product type using activity based costing. (8 marks)

Answer:

Computation of Activity Rate

Cost Pool	Cost (₹) [A]	Cost Driver [B]	Cost Driver Rate (₹) [C] = [A]÷[B]
Machine Department Expenses	18,48,000	Machine Hours (1,32,000 hrs.)	14.00
Assembly Department Expenses	6,72,000	Assembly Hours (42,000 hrs.)	16.00
Setup Cost	90,000	No. of Production Runs (450*)	200.00
Stores Receiving Cost	1,20,000	No. of Requisitions Raised on the Stores (120)	1,000.00
Order Processing and Dispatch	1,80,000	No. of Customers Orders Executed (3,750)	48.00
Inspection and Quality Control Cost	36,000	No. of Production Runs (450*)	80.00
Total (₹)	29,46,000		

*Number of Production Run is 450 (150 + 120 + 180)

Statement Showing Overheads Allocation

Particulars of Cost	Cost Driver	P	Q	R	Total
Machine Department Expenses	Machine Hours	4,20,000 (30,000 × ₹14)	6,72,000 (48,000 × ₹14)	7,56,000 (54,000 × ₹14)	18,48,000
Assembly Department Expenses	Assembly Hours	2,40,000 (15,000 × ₹16)	---	4,32,000 (27,000 × ₹16)	6,72,000
Setup Cost	No. of Production Runs	30,000 (150 × ₹200)	24,000 (120 × ₹200)	36,000 (180 × ₹200)	90,000

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Stores Receiving Cost	No. of Requisitions Raised on the Stores	40,000 (40 × ₹1,000)	30,000 (30 × ₹1,000)	50,000 (50 × ₹1,000)	1,20,000
Order Processing and Dispatch	No. of Customers Orders Executed	60,000 (1,250 × ₹48)	48,000 (1,000 × ₹48)	72,000 (1,500 × ₹48)	1,80,000
Inspection and Quality Control Cost	No. of Production Runs	12,000 (150 × ₹80)	9,600 (120 × ₹80)	14,400 (180 × ₹80)	36,000
Overhead (₹)		8,02,000	7,83,600	13,60,400	29,46,000

2015 - Nov [1] {C} (b) Classify the following items under appropriate categories of quality costs, viz., Prevention Costs (PC), Appraisal Costs (AC), Internal Failure Costs (IFC) and External Failure Costs (EFC):

- (i) Unplanned replacement to customers
- (ii) Correction of a bank statement
- (iii) Design review
- (iv) Equipment accuracy check
- (v) Staff training
- (vi) Reprocessing of a loan operation
- (vii) Product liability warranty
- (viii) Product acceptance
- (ix) Wastage of material
- (x) Planned maintenance of equipment

(Candidates may opt for the following format and fill in the appropriate Roman numerals under each column)

Costs →	PC	AC	IFC	EFC
Q. Nos. →				

(5 marks)

Answer:**Appropriate Categories of Quality Costs**

Costs	PC	AC	IFC	EFC
Q. Nos.	(iii)	(iv)	(ii)	(i)
	(v)	(viii)	(vi)	-
	(x)	-	(ix)	(vii)

2015 - Nov [2] (a) Innovation Ltd. has entered into a contract to supply a component to a company which manufactures electronic equipments. Expected demand for the component will be 70000 units totally for all the periods. Expected sales and production cost will be:

Period	1	2	3	4
Sales (units)	9500	17000	18500	25000
Variable cost per unit	30	30	32.50	35

Total fixed overheads are expected to be ₹ 14 lakhs for all the periods.

The production manager has to decide about the production plan.

The choices are:

Plan 1: Produce at a constant rate of 17500 units per period. Inventory holding costs will be ₹ 6.50 per unit of average inventory per period.

Plan 2: Use a Just-In-Time (JIT) system

Maximum capacity per period normally 18000 units

It can produce further upto 10000 units per period in overtime.

Each unit produced in overtime would incur additional cost equal to 30% of the expected variable cost per unit of that period.

Assume zero opening inventory.

(i) Calculate the incremental production cost and the savings in inventory holding cost by JIT production system.

(ii) Advise the company on the choice of a plan. (8 marks)

Answer:

(i) Statement Showing Inventory Holding Cost under Plan 1

Particulars		Pd. 1	Pd. 2	Pd. 3	Pd. 4
Opening Inventory	...(A)	-	8,000	8,500	7,500
Add: Production		17,500	17,500	17,500	17,500
Less: Demand/Sales		9,500	17,000	18,500	25,000

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Closing Inventory ... (B)	8,000	8,500	7,500	-
Average Inventory $\left(\frac{A+B}{2}\right)$	4,000	8,250	8,000	3,750
Inventory Holding Cost @ ₹ 6.50	26,000	53,625	52,000	24,375

Inventory Holding Cost for the four periods = ₹ 1,56,000

(₹ 26,000 + ₹ 53,625 + ₹ 52,000 + ₹ 24,375)

Statement Showing 'Additional Cost-Overtime' under Plan 2 (JIT System)

Particulars	Pd. 1	Pd. 2	Pd. 3	Pd.4
Demand/ Sales	9,500	17,000	18,500	25,000
Production in Normal Time	9,500	17,000	18,000	18,000
Production in Over Time ... (A)	---	---	500	7,000
Variable Cost per unit	30.00	30.00	32.50	35.00
Additional Cost – Overtime per unit (@30% of Variable Cost) ... (B)	9.00	9.00	9.75	10.50
Additional Cost – Overtime ... (A) x (B)	---	---	4,875	73,500

Total Additional Payment (Overtime) = ₹ 78,375

(₹ 4,875 + ₹ 73,500)

Statement Showing Additional Variable Cost* under Plan 2 (JIT System)

Particulars	Pd. 1	Pd. 2	Pd. 3	Pd.4	Total
Production (Plan 1)	17,500	17,500	17,500	17,500	70,000
Variable Cost ... (A)	5,25,000	5,25,000	5,68,750	6,12,500	22,31,250
Production (Plan 2, JIT)	9,500	17,000	18,500	25,000	70,000
Variable Cost ... (B)	2,85,000	5,10,000	6,01,250	8,75,000	22,71,250
Total				... (B) – (A)	40,000

* excluding overtime cost

Incremental Production Cost in JIT System = ₹ 78,375 + ₹ 40,000

= ₹ 1,18,375

Therefore, Saving in JIT System (Net)

= ₹ 1,56,000 – ₹ 1,18,375

= ₹ 37,625

(ii) Advice

Though Innovation Ltd is saving ₹ 37,625 by changing its production system to Just- in-time but it has to consider other factors as well before taking any final call which are as follows:-

- (i) Innovation Ltd has to ensure that it receives materials from its suppliers on the exact date and at the exact time when they are needed. Credentials and reliability of supplier must be thoroughly checked.
- (ii) To remove any quality issues, the engineering staff must visit supplier's sites and examine their processes, not only to see if they can reliably ship high- quality parts but also to provide them with engineering assistance to bring them up to a higher standard of product.
- (iii) Innovation Ltd should also aim to improve quality at its process and design levels with the purpose of achieving "Zero Defects" in the production process.
- (iv) Innovation Ltd should also keep in mind the efficiency of its work force. Innovation Ltd must ensure that labour's learning curve has reached at steady rate so that they are capable of performing a variety of operations at effective and efficient manner. The workforce must be completely retrained and focused on a wide range of activities.

2015 - Nov [6] (a) X Ltd. makes a single product with the following details:

Description	Current Situation	Proposed Change
Selling Price (₹/ unit)	10	
Direct Costs (₹/ unit)	5	
Present number of setups per production period, (before each production run, setup is done)	42	
Cost per set up (₹)	450	Decrease by ₹ 90
Production units per run	960	1008
Engineering hours for production period	500	422
Cost per engineering hour (₹)	10	

The company has begun Activity Based Costing of fixed costs and has presently identified two cost drivers, viz. production runs and engineering hours. Of the total fixed costs presently at ₹ 96,000, after the above, ₹ 72,100 remains to be analysed. There are changes as proposed above for the next production period for the same volume of output.

- (i) How many units and in how many production runs should X Ltd. produce in the changed scenario in order to break - even?
- (ii) Should X Ltd. continue to break up the remaining fixed costs into activity based costs? Why? (8 marks)

Answer:

(a) Workings

Statement Showing 'Non-unit Level Overhead Costs'

Particulars	Current Situation	Proposed Situation
No. of Production Runs/ Setups	42	40 $\left(\frac{960 \text{ runs} \times 42 \text{ setup}}{1,008 \text{ units}} \right)$
Cost per Setup	₹ 450	₹ 360
Production Units per run	960 units	1,008 units
Production Units	40,320 (960 units × 42)	40,320
Engineering Hrs.	500	422
Engineering Cost per hour	₹ 10	₹ 10

Requirement of Question

(i) Break Even Point (Changed Scenario)

Break Even Point

$$= \frac{\text{Fixed Cost} + (\text{Setup Cost} \times \text{No. of Setups}) + (\text{Engineering Costs} \times \text{No. of Engineering Hrs.})}{(\text{Price} - \text{Unit Variable Cost})}$$

$$= \frac{\text{₹72,100} + (\text{₹360} \times \text{40 Setups}) + (\text{₹10} \times \text{422 hrs.})}{(\text{₹10} - \text{₹5})} = 18,144 \text{ units}$$

Break Even Point (No. of Production Runs)

$$= \frac{\text{Break Even (units)}}{\text{Production (units per run)}} = \frac{18,144 \text{ units}}{1,008 \text{ units}}$$

= 18 Runs

(ii) A company should adopt Activity Based Costing (ABC) system for accurate product costing, as traditional volume based costing system does not take into account the Non-unit Level Overhead Costs such as Setup Cost, Inspection Cost, and Material Handling Cost etc. Cost Analysis under ABC system showed that while these costs are largely fixed with respect to sales volume, but they are not fixed to other appropriate cost drivers. If break up of the remaining ₹ 72,100 fixed costs consist of only a small portion of these costs, ABC need not be applied.

However, it may also be noted that the primary study has resulted in cost savings. If the savings in cost are expected to exceed the cost of study and implementing ABC, it may be justified. Further it is pertinent to mention that ABC offers no increase in product-costing accuracy for single-product setting.

2016 - May [1] {C} (a) UK Ltd. prepared a draft budget for the next year as follows:

Quantity	10,000 units
	₹
Selling price per unit	60
Variable cost per unit	
– Direct materials	16
– Direct labour (2 hours × ₹ 6)	12
– Variable overheads (2 hrs * ₹ 1)	2
Contribution per unit	30
Total budgeted contribution	3,00,000
Total budgeted fixed overheads	2,80,000
Total budgeted profit	20,000

The board of directors are not satisfied with this draft budget and suggested the following changes for the better profit:

- (i) The budgeted profit is ₹ 50,000,
- (ii) The company should spend ₹ 57,000 on advertisement and the target sales price up to ₹ 64 per unit.
- (iii) It is expected that the sales volume will also rise, inspite of the price rise, to 12,000 units.

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In order to achieve the extra production capacity, however, the work force must be able to reduce the time taken to make each unit of the product. It is proposed to offer a pay and productivity deal in which the wages rate per hour is increased to ₹ 8. The hourly rate for variable overheads will be unaffected. You are required to calculate the target labour time require to achieve the target profit. (5 marks)

Answer:

Statement Showing 'Target Cost of Direct Labour & Variable Overheads'

Particulars	Amount (₹)
Expected Sales (₹ 64 × 12,000 units)	7,68,000
Less: Direct Material (₹ 16 × 12,000 units)	1,92,000
Advertisement Expenses	57,000
Fixed Overheads	2,80,000
Target Profit	50,000
Target Cost of Direct Labour and Variable Overheads	1,89,000

Target Labour Time Required to achieve Target Profit

$$\begin{aligned}
 &= \frac{\text{Target Cost of Direct Labour and Variable Overheads}}{\text{Wages Rate} + \text{Variable Overhead Rate}} \\
 &= \frac{\text{₹1,89,000}}{\text{₹8} + \text{₹1}} \\
 &= 21,000 \text{ hrs.}
 \end{aligned}$$

2016 - May [2] (a) A company produces and sells a single product. The cost data per unit for the year 2017 is predicted as below:

	₹ Per unit
Direct material	35
Direct labour	25
Variable overheads	15
Selling price	90

The company has forecast that demand for the product during the year 2017 will be 28,000 units. However, to satisfy this level of demand, production quantity will be increased?

There are no opening stock and closing stock of the product.

The stock level of material remains unchanged throughout the period.

The following additional information regarding costs and revenue are given:

- 12.5% of the items delivered to customers will be rejected due to specification failure and will require free replacement. The cost of delivering the replacement item is ₹ 5 per unit.
- 20% of the items produced will be discovered faulty at the inspection stage before they are delivered to customers.
- 10% of the direct material will be scrapped due to damage while in storage.

Due to above, total quality costs for the year is expected to be ₹ 10,75,556.

The company is now considering the following proposal:

1. To introduce training programmes for the workers which, the management of the company believes, will reduce the level of faulty production to 10%. This training programme will cost ₹ 4,50,000 per annum.
2. To avail the services of quality control consultant at an annual charges of ₹ 50,000 which would reduce the percentage of faulty items delivered to customers to 9.5%.

You are required to:

- (i) Prepare a statement of expected quality costs the company would incur if it accepts the proposal. Costs are to be calculated using the four recognised quality costs heads.
- (ii) Would you recommend the proposal? Give financial and non-financial reasons. (8 marks)

Answer:

(i) Statement Showing 'Expected Quality Costs'

Particulars	Current Situation (₹)	Proposed Situation (₹)
Prevention Costs	—	4,50,000
Appraisal Costs	—	50,000
External Failure Costs	3,20,000	2,35,120
Internal Failure Costs	7,55,556	3,91,538
Total Quality Costs	10,75,556	11,26,658

Workings**External Failure Cost**

Particulars	Current Situation	Proposed Situation
Customer's Demand ... (A)	28,000 units	28,000 units
Number of units Dispatched to Customers ... (B) $\left(\frac{28,000 \text{ units}}{87.5\%}\right); \left(\frac{28,000 \text{ units}}{90.5\%}\right)$	32,000 units	30,939 units
Number of units Replaced ... (B) – (A)	4,000 units	2,939 units
External Failure Cost {4,000 units × ₹ (35+25+15+5)}; {2,939 units × ₹ (35+25+15+5)}	₹ 3,20,000	₹ 2,35,120

Internal Failure Cost

Particulars	Current Situation	Proposed Situation
Number of units Dispatched to Customers ... (A)	32,000 units	30,939 units
Number of units Produced & Rejected ... (B) $\left(\frac{32,000 \text{ units}}{80\%}\right); \left(\frac{30,939 \text{ units}}{90\%}\right)$	40,000 units	34,377 units
Number of units Discovered Faulty ... (B) – (A)	8,000 units	3,438 units
Cost of Faulty Production ... (D) {8,000 units × ₹ (35+25+15)}; {3,438 units × ₹ (35+25+15)}	₹ 6,00,000	₹ 2,57,850
Material Scrapped $\left(\frac{40,000 \text{ units} \times 10\%}{90\%}\right); \left(\frac{34,377 \text{ units} \times 10\%}{90\%}\right)$	4,444.44 units	3,819.67 units
Cost of Material Scrapped ... (E) {4,444.44 units × ₹ 35}; {3,819.67 units × ₹ 35}	₹ 1,55,556	₹ 1,33,688
Internal Failure Cost ... (D) + (E)	₹ 7,55,556	₹ 3,91,538

(ii) Recommendation:

On purely financial grounds the company should not accept the proposal because there is an increase of ₹ 51,102 in quality costs. However there may be other factors to consider as the company may enhance its reputation as a company that cares about quality products and this may increase the company's market share.

On balance the company should accept the proposal to improve its long-term performance.

2016 - Nov [2] (a) Speedo Limited is a specialist car manufacturer that produces various models of cars. The organization is due to celebrate its 100th anniversary next year. To mark the occasion, Speedo Limited intends to produce a sports car; the Model Royal. As this will be a special edition, production will be limited to 1,000 numbers of Model Royal Cars.

Speedo Limited is considering using a target costing approach and has conducted market research to determine the features that consumers require in a sports car. Based on this market research and knowledge of competitor's products, company has decided to price the Model Royal at ₹ 9.75 Lacs. Company requires an operating profit margin of 25% of the selling price of the car. Details for the forthcoming year are as follows:

Forecast of direct costs for a Model Royal Car-

Labour ₹ 2,50,000

Material ₹ 4,75,000

Forecast of annual overhead costs-

	₹ in lacs	Cost driver
Production line cost	2,310	See note 1
Transportation costs	900	See note 2

Note 1:

The production line that would be used for Model Royal has a capacity of 60,000 machine hours per year. The production line time required for Model Royal is 6 machine hours per car. This production line will also be used to make other cars and will be working at full capacity.

Note 2:

Some models of cars are delivered to showrooms using car transporters. 60% of the transportation costs are related to the number of deliveries made. 40% of the transportation costs are related to the distance travelled.

The car transporters have forecast to make a total of 640 deliveries in the year and carry 10 cars each time. The car transporter will always carry its maximum capacity of 10 cars.

The total annual distance travelled by car transporters is expected to be 2,25,000 kms. 50,000 kms of this is for the delivery of Model Royal cars only. All 1,000 Model Royal cars that will be produced will be delivered in the year using the car transporters.

Required:

- (i) Calculate the forecast total cost of producing and delivering a Model Royal car using Activity Based Costing principles to assign the overhead costs.
- (ii) Calculate the cost gap that currently exists between the forecast total cost and the target total cost of a Model Royal car. (10 marks)

Answer:

Computation of overhead using Activity Based Costing

Particulars	Activity cost pool (₹ in lakhs)	Cost Driver	Cost Driver Qty.	ABC Rate (₹)	Resource Required Royal (1,000 (cars))	OH for Royal (₹)
Production line cost	2,310	machine hours	60,000 machine hours	₹ 3,850 per machine hour	6×1,000 = 6,000 machine hours	2,31,00,000
Transportation						
(i) 60% related to deliveries	900 × 60% = 540	No. of deliveries	640 deliveries	₹ 84,375 per delivery	$\frac{1,000 \text{ cars}}{10 \text{ cars}} = 100 \text{ Delivers}$	84,37,500
(ii) 40% related to distance	900 × 40% = 360	No. of Kms	2,25,000 km	₹ 160 per km	given = 50,000 km	80,00,000

5.80

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Total OH for 1,000 cars of model Royal 3,95,37,500
 So, OH cost per car = Total OH Cost ÷ 1,000 cars 39,537.50

Target cost, forecast total cost and cost Gap

Particulars	₹ per Car
Target selling price per car	9,75,000.00
Less: Target profit on the above selling price (9,75,000×25%)	2,43,750.00
1. Target Total Cost	7,31,250.00
2. Forecast total costs:	
Material	4,75,000.00
Labour	2,50,000.00
OH (WN 1)	39,537.50
	7,64,537.50
3. Cost Gap. between forecast total cost and the target cost (1- 2) (cost reduction required)	(33,287.50)

2016 - Nov [5] (b) ABC Ltd. produces three products A, B and C. The following information is available for a period:

Product	A	B	C
Contribution per unit (Sales – Direct Materials) (₹)	30	25	15

Machine hours required per unit of production:

Product	Machine hours required per unit			Through put Accounting ratio
	A	B	C	
Machine 1	10	2	4	133.33%
Machine 2	15	3	6	200.00%
Machine 3	5	1	2	66.67%

Estimated sales demand for A, B and C are 500 units each and machine capacity is limited to 6,000 hours for each machine.

Required:

Analyse the above information and apply theory of constraints process to remove the constraints. How many units of each product will be made?

(6 marks)

Answer:

Note: TA Ratio is highest for 'Machine' . So, 'Machine 2' is the bottleneck. Total 'Machine 2' hours available = 6,000.

Particulars	A	B	C
1. Throughput contribution per unit (given) ₹	30	25	15
2. 'Machine 2' hours required per unit	15	3	6
3. Contribution per 'Machine 2' hours (1 ÷ 2) (₹)	2	8.33	2.50
4. Ranking	III	I	II
5. Maximum sales Demand (units)	500	500	500
6. 'Machine 2' hours required (2×5)	7,500	1,500	3,000
7. 'Machine 2' hours allocated based on ranking	(bal. fig.) 1,500	(I Rank) 1,500	(II Rank) 3,000
8. Possible output quantity (7 ÷ 2) (units)	100	500	500

2017 - May [5] (a) A company can make any or both of products A and B in a production period not exceeding a total of 10,000 units due to non-availability of the required material and labour. Until now, the company had been taking decisions on the product mix, based on the following marginal cost analysis.

	A (₹ / u)	B (₹ /u)
Selling Price	100	120
Variable Cost	<u>60</u>	<u>70</u>
Contribution	40	50
Total fixed costs		3,00,000

Since the decisions based on the above approach did not yield the required results, the fixed costs were analysed as follows for 10,000 units of only A or 10,000 units of only B.

Item of Cost	Details for A	A (Amt.)	B (Amt.)	Details for B
Set up cost	10 production runs	40,000	75,000	10 production runs
Distribution cost	₹ 120 / box	60,000	25,000	₹ 200 per box
Step fixed cost	₹ 4,000 per 2,000 units	20,000	50,000	₹ 5,000 per 1000 units
Total		1,20,000	1,50,000	

₹ 30,000 can be taken as the unanalysed fixed cost, and unavoidable whether A or B or both are produced.

The following cost reduction measures were taken by the Product Managers of A and B:

	A	B
Increase in number of units per run to	2000 units	1250 units
Increase in the number of units per box distributed to	30 units	125 units

Further, the Management ensured availability of raw material and labour to support a production of 15000 units of either A or B or both together. There was no change to the step costs or contribution. However, the total unanalysed fixed cost increased to ₹ 32,000.

- (i) Based on the principles of Activity Based Costing, prepare a statement showing the contribution and item wise analysed overheads for each product, arrive at the profitability of A and B and then the final profits if 15000 units of only A or 15000 units of only B are manufactured.
 - (ii) Find the minimum break-even point in units if only product A is manufactured after the cost reduction. (12 marks)
- (b)** A toy company 'T' expects to successfully launch Toy Z based on a film character. T must pay 15% royalty on the selling price to the film company. T's targets a selling price of ₹ 100 per toy and profit of 25% selling price. The following are the cost data forecast:

	₹ / toy
Component A	8.50
Component B	7.00
Labour : 0.4 hr @ ₹ 60 per hr	24.00
Product specific overheads	13.50

In addition, each toy requires 0.6 kg of other materials, which are supplied at a cost of ₹ 16 per kg with a normal 4% substandard quality which is not usable in the manufacture.

You are required to determine if the above cost structure is within the target cost. If not, what should be the extent of cost reduction?

(4 marks)

KZ - 2

Knowledge Zone

Value Analysis as a Cost Reduction Technique

Value analysis or value engineering is one of the most widely used cost reduction techniques. It can be defined as a technique that yields value improvement. It is the process of systematic analysis and evaluation of various techniques and functions with a view to improve organisational performance. It aims at reducing and controlling costs of a product from the point of view of its value by analysing the value currently received. It investigates into the economic attributes of value. It attempts to reduce cost through design change, modification of material specification, change in the source of supply and so on. It emphasises on finding new ways of getting equal or better performance from a product at a lesser cost without affecting its quality, function, utility and reliability. For example, the function of fastener is to join two or more parts. Value analysis examines the value of this function in terms of alternative methods such as welding, taping, stapling, etc. in view of the stress and vibrations involved in a specific application.

In value analysis each and every product or component of a product is subjected to a critical examination so as to ascertain its utility in the product, its cost, cost benefit ratio, and better substitute etc. When the benefits are lower than the cost, advantage may be gained by giving up the activity concerned or replacing it for betterment. The best product is one that will perform satisfactorily at the lowest cost.

The various steps involved in value analysis are:

- (1) identification of the problem;
- (2) collecting information about function, design, material, labour, overhead costs, etc., of the product and finding out the availability of the competitive products in the market; and
- (3) exploring and evaluating alternatives and developing them.

KZ - 3

Knowledge Zone

Total Quality Management (TQM) facilitate value addition in an organisation

TQM is a management method relying on the co-operation of all the members of an organization. It is a management-technique that centres on quality and long term success of the organization through satisfaction of the customers as well as the benefit of all its members and society.

Since TQM focuses the attention of an organization on quality, thus it helps to provide the customer with much higher quality prudent expenditure on cost of preventing errors can often lead to larger reduction in cost of failure and consequently will lead to reduce the total cost. The organizations constantly strive for improvement so that more and more value can be added through improved quality of product at lower cost.

KZ - 4

Knowledge Zone

Target Costing

It is a management tool used for reducing a product costs over its entire life cycle. It is driven by external market factors. A target market price is determined by marketing management prior to designing and introducing a new product. This target price is set at a level that will permit the company to achieve a desired market share and sales volume. A desired profit margin is then deducted to determine the target maximum allowable product cost. Target costing also develops methods for achieving those targets and means to test the cost effectiveness of different cost-cutting scenarios.

Stages to the methodology:

1. **Conception (planning) Phase:** Under this stage of life cycle, competitors products are to be analysed, with regard to price, quality,

service and support, delivery and technology. The features which consumers would like to have like consumer value etc. established. After preliminary testing, the company may be asked to pinpoint a market niche, it believes, is under supplied and which might have some competitive advantage.

2. **Development phase:** The design department should select the most competitive product in the market and study in detail the requirement of materials, manufacturing process along with competitors cost structure. The firm should also develop estimates of internal cost structure based on internal costs of similar products being produced by the company. If possible the company should develop both the cost structure (competitors and own) in terms of cost drivers for better analysis and cost reduction.
3. **Production phase:** This phase concentrates its search for better and less expensive products, cost benefit analysis in different features of a product priority wise, more towards less expensive means of production, as well as production techniques etc.

KZ - 5**Knowledge Zone****Steps involved in Target Costing Approach to Pricing**

1. **Setting of target selling price:** The setting of target selling price of a product which the customers are prepared to pay, depends on many factors like: design specifications of the product, competitive conditions, customers demand for increased functionality and higher quality projected production volume, sales forecasts etc. A concern can set its target profit margin from target selling price after taking into account all of the aforesaid factors.
2. **Determination of target cost:** Target profit margin may be established after taking into account long-term profit objectives and projected volumes of sales. On deducting target profit margin from target selling price, target cost is determined.
3. **Estimate the actual cost of the product:** Actual cost of the product may be determined after taking into account the design specifications, material cost and other costs required to produce the product.

- 4. Comparison of estimated actual cost with target cost:** In case the estimated cost of the product is higher than that of the target cost of the product then the concern should resort to cost reduction methods involving the use of value engineering/value analysis tools.

KZ - 6**Knowledge Zone****Activity Based Costing**

Concept of ABC - Activity Based Costing is an accounting methodology that assigns costs to activities rather than products or services. This enables resources and overhead costs to be more accurately assigned to products and services that consume them. In order to correctly associate costs with products and services, ABC assigns cost to activities based on their use of resources. It then assigns cost to cost objects, such as products or customers, based on their use of activities. ABC can track the flow of activities in organization by creating a link between the activity (resource consumption) and the cost object.

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

ABC system supports corporate strategy in the following ways

1. ABC system supports corporate strategy by providing information at the operational and strategic level. This helps the management -
 - (a) Better decision making is possible with regards to pricing, marketing product design, product mix due to accurate information on product cost.
 - (b) Comparison of profit is possible.
 - (c) Price strategy can be decided more efficiently.
 - (d) Better controlling is possible on the basis of account feed back.
2. ABC system reports on resource spending.
3. ABC system helps in redesigning the product.
4. ABC helps managers to improve the processes.
5. ABC helps in reducing set up time, by rationalizing plant layout.

KZ - 7**Knowledge Zone**

Value Added Activities (VA)	Non Value Added Activities (NVA)
1. VA activities are those activities which add value to the product or services.	1. NVA activities are those activities which do not add value to the product or services.
2. These activities are necessary for the performance of the process.	2. These activities are not fully necessary for the performance of the process.
3. It represents work that is valued by the external or internal customer.	3. It represents work that is not valued by the external or internal customer.
4. They improve the quality or function of a product.	4. They do not improve the quality or function of a product.
5. The customers are usually willing to pay for the services. Hence VA activities result in cost and not in losses	5. They create waste results in delay of some sort, add cost to the product or services for which the customer is not willing to pay.
Example: Marking product more versatile for certain other use like polishing the furniture.	Example: Scheduling or re-scheduling of material and machine set up for a particular process.

KZ - 8**Knowledge Zone**

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:

1. 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.
2. 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.
3. 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.

KZ - 9**Knowledge Zone**

JIT approach helps in improving an organizations profitability in the following way:

- (i) **By eliminating non-value added activities:** Non value added activities do not improve the quality or function of a product or service but they can adversely affect cost and price. Thus JIT system significantly reduces cost by identifying NVA activities and subsequently eliminating them.

- (ii) **Zero Defects:** JIT firms decrease defect rates subsequently reducing their inventory and enhancing the attributes of their products. Zero defect policy eliminates all internal and external failure costs.
- (iii) **Cellular manufacturing system:** The operators are trained to operate all the machines on the line and undertake preventive maintenance.
- (iv) **Adopting pull manufacturing system:** Pull manufacturing system reduces idle time thereby reducing cost of production.
- (v) **JIT purchasing:** JIT purchasing substantially reduces investment in raw materials and WIP stocks. It also reduces cost through saving in factory space and availing benefit of negotiating with fewer suppliers and reduction of paper work.

KZ - 10**Knowledge Zone**

Total Quality Management: is a technique whose usefulness is confined not only to manufacturing processes but TQM assumes potentially greater importance as a tool for improved efficiency in service areas also. By focusing on the management accounting function, a process is devised through which quality improvement methods might be used to highlight problem areas and facilitate their solution. An initial understanding of the difference between the three major 'quality' terms, quality control, quality assurance and quality management is essential to the short-medium-and long-term focus of business.

SIX Cs OF TQM

1. **Commitment:** If a TQM culture is to be developed, so that quality improvement becomes a normal part of everyone's job, a clear commitment, from the top must be provided. Without this all else fails. It is not sufficient to delegate 'quality' issues to a single person since this will not provide an environment for changing attitudes and breaking down the barriers to quality improvement.
2. **Culture:** Training lies at the centre of effecting a change in culture and attitudes. Management accountants, too often associate 'creativity' with 'creative accounting' and associated negative perceptions. This must be changed to encourage individual contributions and to make 'quality' a normal part of everyone's job.

3. **Continuous improvement:** Recognition that TQM is a 'process' not a 'program' necessitates that all are committed in the long term to the never-ending search for ways to do the job better.
4. **Co-operation:** The application of Total Employee Involvement (TEI) principles is paramount. The on-the-job experience of all employees must be fully utilized and their involvement and co-operation sought in the development of improvement strategies and associated performance measures.
5. **Customer focus:** The needs of the customer are the major driving thrust; not just the external customer (in receipt of the final product or service) but the internal customer's (colleagues who receive and supply goods, services or information). Perfect service with zero defects in all that is acceptable at either internal or external levels.
6. **Control:** Documentation, procedures and awareness of current best practice are essential if TQM implementation are to function appropriately. The need for control mechanisms is frequently overlooked, in practice, in the euphoria of customer service and employee empowerment. Unless procedures are in place improvements cannot be monitor and measured nor deficiencies corrected.

***Similarly Asked Questions**

No.	Category	Question	Marks	Frequency
1.	Practical	Practical Question of – 08 - Nov [3] (b), 16 - Nov [5] (b)	5, 6	2 Times
2.	Descriptive	Briefly explain the principles associated with synchronous manufacturing. 10 - May [5] (c), 12 - Nov [7] (e), 16 - Nov [7] (c)	5, 4, 4	3 Times

* This table contains the Similarly Asked Questions. Please pay more attention to such question.

Table Showing Marks of Compulsory Questions

Year	12 N	13 M	13 N	14 M	14 N	15 M	15 N	16 M	16 N	17 M
Descriptive										
Practical				5			5	5		
Total				5			5	5		