

FINAL EXAMINATION

(REVISED SYLLABUS - 2008)

GROUP - IV

Paper-15 : MANAGEMENT ACCOUNTING–ENTERPRISE PERFORMANCE MANAGEMENT

Q1. Distinguish between:

- (a) Strategic Planning and Management Control
- (b) Management Control and Operational Control

Answer 1.

(a) Strategic Planning and Management Control :

Characteristic	Strategic Planning	Management Control
Focus of plans	On one aspect at a time	On whole organization
Complexities	Many variables	Less complex
Degree of structure	Unstructured and irregular: each problem different	Rhythmic: prescribed Procedures
Nature of information	Tailor-made for the problem; more external and predictive; less accurate	Integrated; more internal and historical; more accurate
Communication of information	Relatively simple	Relatively difficult
Purpose of estimates	Show expected results	Lead to desired results
Persons primarily involved	Staff and top management	Line and top management
Number of persons involved	Small	Large
Mental activity	Creative; analytical	Administrative: persuasive
Source discipline	Economics	Social psychology
Planning and control	Planning dominant, but some control	Emphasis on both planning and control
Time horizon	Tends to be long	Tends to be short
End result	Policies and precedents	Action within policies and Precedents
Appraisal of the job done	Extremely difficult	Much less difficult

(b) Management Control and Operational Control :

Characteristic	Management Control	Operational Control
Focus of activity	Whole operation	Single task or transaction
Judgment	Relatively much; subjective decision	Relatively little; reliance on rules
Nature of structure	Psychological	Rational
Nature of information	Integrated; financial data throughout; approximations acceptable; future and historical	Tailor – made to the operation often non – financial; precise; often in real time
Persons primarily involved	Management	Supervisors (or none)
Mental activity	Administrative; persuasive	Follow directions (or none)
Source discipline	Social psychology	Economics; physical sciences
Time horizon	Weeks, months, years	Day to day
Type of costs	Discretionary	Engineered

Q2. Discuss Matrix structure of organization. What are its advantages and disadvantages?**Answer 2.****Matrix Structure:**

Matrix Organisation Structure combines the coordination and control of the decentralized structure with the technical excellence economies of scale of the functional structures to reap the benefits of both. While managing complex programs as in large high-technology programs, complex products and services and multinational business, organization face several coordination problems. A matrix avoids such problems as the total responsibility for achieving the goals and objective of the program lies with Program Manager but must share resources from the various functional heads. The functional managers assigned to the projects are administratively reporting to the Project Manager but functionally to the Function Head.

The distinguishing feature of the matrix structure is thus the dual dimensions of management embodied in it. The outputs produced by the organization may be identified in the rows of the matrix while functional inputs utilized by each project may be identified in the columns of the matrix. The total outputs of the functions are found in the last column of the matrix. Though the Project Manager assumes full responsibility for delivery of a product which meets performance specifications he does not have direct authority over the functional organization that actually performs the work. The functional personnel thus operate under the knowledge-based authority of the function and the resource-based authority of the Project Manager. This may create a friction in the course of the work but it is up to the Project Manager to use it as a creative friction to further the goals of the program.

The matrix organization structure is suitable for projects which are not large enough to warrant a fully decentralized set-up, with all functional managers under each project. Decentralization may result in loss of scale economics, by way of duplication of functional services for several projects. The matrix structure is suitable for projects of short duration.

Advantages

- (a) Ensures better coordination and control of the decentralized structure along with achieving technical excellence and economies of scale of the functional organization,
- (b) Fosters creativity and multiple sources of diversity,
- (c) Broader middle-management exposure to strategic issues of the business,
- (d) Acts as a good training ground for future leaders.

Disadvantages

- (a) Dual accountability as explained above, which may create confusion,
- (b) Necessitates tremendous horizontal and vertical coordination,
- (c) Difference in orientation between Program and Functional personnel. The functional person may aim for high technical performance not warranted by project requirement,
- (d) Diffuse responsibility - as responsibility is distributed between program and functional personnel becomes difficult to administer system of accountability, leading to potential conflict,
- (e) Program personnel may have a sense of insecurity as soon as a project is completed and this may lower their morale,
- (f) The design of the reward structure for program and functional personnel is a ticklish issue which should be worked out in a fair and transparent manner to satisfy all.

Q3. Discuss Management Style & Culture.**Answer 3.**

Management Style may be summarized as a continuum between highly autocratic or external style or Theory X Style and highly participative or internal style or Theory Y style.

In the external style there is

- (a) Centralisation of authority and decision making and lower levels of management have to strictly comply with the formal procedures laid.
- (b) The organization structure is pyramidal in nature.
- (c) Detailed formal planning and control systems are formulated which are rigid in nature.
- (d) There is strict supervision and guided tight control.
- (e) There is no freedom given and no empowerment at lower level.
- (f) Rewards and incentives are used effectively to motivate employee.

This system does produce results, but it may demotivate employees who like to have more freedom in the work environment. Further it may thwart the innovative spirit. The intense competition amongst employees may even create a tense atmosphere in the organization which may not be conducive to long term growth.

However in case the employees are very subservient and not enterprising, this style may suit such organization.

The classic illustration of this external style was the one practiced by Harold Geneen of ITT in U.S. with a highly centralized tight central system. He personally made detailed evaluations of the performance of business units instead of monitoring the overall performance only, leaving the details to the unit managers.

Internal Style: The internal style is participative in nature and employees are given the freedom to offer suggestions, come out with innovations and take part in the decision making process. There is thus

- (a) Decentralization of authority i.e., bottom-up approach

- (b) The organization structure is flat.
- (c) Rules and procedures are flexible.
- (d) There is empowerment of employee which may encourage their creative spirit to blossom.
- (e) The organization promotes commitment and self-control rather than thrusting a stifling control on employees.

In this style of management there may be a tendency on the part of some employees, who are not self motivated, to be passengers, without making any positive contribution to the organization. There is also the danger of each employee going his own way resulting in chaos, and to avoid such eventuality suitable coordinating mechanism must be in places. Moreover, the individual behavior must be goal-congruent with that of the organization.

John Chambers of CISCO practiced a participatory approach and encouraged his employees to lead, make good decision and take risks willingly.

Jack Welch the legendary CEO of General Electric was an autocratic leader in his early career, inviting the nickname of "Newtron Jack". From 1990s he transformed his style into one of involving people in decision-making and making use of the brain of every worker. His ambitions goal was to remove the "boss element" for G.E and to make it a boundary less organization.

Jeff Immelt who succeeded Jack Welch in 2001 is adored by everyone in G.E. for being a friendly likeable leader, with a proven track record.

In India, Infosys is a typical example of a company practicing a democratic approach in management.

Toyota is well-known for its philosophy of encouraging employees to come out with suggestions for improvement and rewarding them.

Mixed Style : This is a composite of both the above styles, blending the advantages of each, without their drawbacks. Human nature being what it is, proper functioning of any organization requires suitable checks and balances. A control style based exclusively on intrinsic motivation seems to be naïve. A rigid authoritarian style, cast in a rule-bound framework, may be a noose round the organization Murugappa group is a good example of this modified style of management. While the Board lays down the major policies and broad guidelines the professional divisional managers are given total freedom to attain the organizations goals.

Management Culture : Culture consists of shared values, beliefs and norms of organization which grew over time based upon the assumptions of what it takes to be successful. While management style is associated with individual managers, corporate culture is pervasive and is an organizational concept.

Culture facilitates cooperation & communication within the organization; however, if the beliefs are not consistent with the needs of business, dysfunctional consequences may follow.

A shared belief also ensures greater commitment of the employee to the organization.

BSNL's complacent culture in a monopolized environment had to undergo a radical shift to a market oriented approach when the telecom sector was de-regulated.

Q4. What is Benchmarking ? Discuss different types of Benchmarking.

Answer 4.

Benchmarking is the continuous, systematic process of measuring one's output and/or work processes against the toughest competitors or those recognized best in the industry.

Benchmarking should not be treated as just comparison. It is necessary to have a point of reference to know how well one is doing. Comparing the results with a competitor helps the management to get a goal that is both desirable and achievable but provides no clue on how the goals are to be achieved.

Benchmarking is a systematic and continuous measurement process. It is a process of measuring and comparing an organisation's business processes against business process leaders anywhere in the world, to gain information which will help the organization to improve its performance. It is basically a quality practice. Companies choose to benchmark excellent companies whose business processes are analogous to their own.

Types of Benchmarking :

Different types of benchmarking are outlined below, though some of them seem to overlap.

(a) Product Benchmarking (Reverse Engineering) :

This is an age old practice of product oriented reverse engineering. Every organization buys its rival's products and tears them down to find out how the features and performances etc. compare with its products. This could be the starting point for improvement. When Ford Motor company redesigned the Taurus in 1992, it benchmarked 209 features on the car against 7 competitors. The company then worked to match / excel the higher standard set by any of its rival, in each of these features with its own product.

Japanese seemed to have excelled at this practice but to their credit it must be said that they just do not imitate, but ingeniously innovate.

(b) Competitive Benchmarking :

"A Measure of organizational performance compared against competing organization; studies the target specific product designs, process capabilities or administrative methods used by a company's direct competitors".

Competitive Benchmarking moved beyond product oriented comparisons to include comparisons of process with those of competitors. In this benchmarking, the process studied may include marketing, finance, human resource, R & D etc. A typical example would be the classical study the Rank Xerox performed with those of Canon and other photo copier manufacturers when it faced heightened competition from US and Japanese companies.

(c) Process Benchmarking :

"The activity of measuring discrete performance and functionality against organizations through performance in excellent analogous business processes".

To gain leadership position it is essential to look at a paradigm-shifting jump to a new way of managing a process; for this you may have to go beyond your industry and look at the "best-in-breed" to bring about a fundamental change and not just an incremental improvement. India benchmarks its distribution and logistics function not with cadbury.

Nestle but with Hindustan Lever Ltd. For supply chain management the best practice would be that of Mumbai Dubbawallas, which has now won universal acclaim.

(d) Internal Benchmarking :

"An application of process benchmarking performed, within an organisation by comparing the performance of similar business units or business processes".

Hewlett Packard through an extensive internal benchmarking exercise on the Best Scheduling Practice amongst its several product groups was able to cut its "time-to-market" by half. For a company like HP introduction of new products in time was a crucial performance metric.

(e) Strategic Benchmarking :

"The application of process benchmarking of the level of business strategy; a systematic process for evolving alternatives, implementing strategies, and improving performance by understanding and adapting successful strategy from external partners who participated in an on-going business alliance".

It will be seen that strategic benchmarking differs from operational benchmarking in its scope; it helps to develop a vision of the changed organisations; it will develop core competencies that will help sustained competitive advantage; targeting a specific shift in strategy such as entering new markets or develop new products, developing a new line of business or making an acquisition and creating an organisation that is more capable of learning how to respond in an uncertain future because it has increased its acceptance of change.

(f) Global Benchmarking :

This is defined as "the extension of strategic benchmarking to include benchmarking partners on a global scale". A classic example of global benchmarking is given by Michael Hammer in his book "Re-engineering the corporation". He cites the example of Ford Company of US, which benchmarked its accounts payable function with that of Mazda in Japan and found to its astonishment that the entire function was managed by 5 persons as against 500 in Ford.

Q5. Write short notes on :

- (a) BPR
- (b) JIT
- (c) Demand Stimulation
- (d) Level Strategy

Answer 5.**(a) BPR :**

Davenport and Short have defined BPR as 'the analysis and design of workflows and processes within and between organisations'.

According to Teng, BPR is 'the critical analysis and radical re-design of existing business processes to achieve improvements in performance measures'.

A comparison between Total Quality Management and BPR shows that BPR requires the change to be fundamental and thus more beneficial to the customers.

BPR is a continuous process of rethinking, re-assessment, re-design, evaluation of each element of business process and consequent improvement in structure and work place. It takes care of all facets of operation in an organization. It gives stress on management system, social system and behavioural system. It analyses them and comes out with proposed change in process of operation. Re-engineering efforts is towards bringing changes.

While the concept is generally understood in relation to direct areas of operations of a business such as production, marketing or distribution, it is equally applicable to indirect areas such as finance, accounting, personnel etc. BPR means starting all over, starting from scratch

- It starts with the top management and with a corporate vision.
- Targeting customers and trying to improve systems and procedures to achieve this.
- Increasing the clock speed of the organization.
- Drilled down the thinking process for each vital element of the organization like personnel, structure design, drawings, raw materials, accounting practices, MIS, finance and find out the constraints/ bottlenecks in the process.
- Avoids unnecessary work, demolish obsolete methods and systems if required.

(b) JIT :

Just in time (JIT) philosophy was first developed in Japan. Toyota introduced it in 50's and later, other companies in Japan have adopted it.

The overriding feature of JIT is that materials or parts are generated in the exact quantity required and just at the time they are needed. A classic JIT system consists of a series of manufacturing units each delivering to one another in successive stages of production. The amount delivered by each unit to the next unit is exactly what the needs for the next production period (usually one day). There are no safety margins in the form of buffer stock, live storage or work-in-progress. JIT is a sophisticated approach in eliminating wastage in the process of manufacturing in different stages, say, from the production design stage to the stage of delivery of finished product. JIT is sometimes regarded as an inventory control technique or a purchasing method. It aims at eliminating all activities which do not add 'value' to the product.

Schonberger defines JIT as being 'to produce and deliver finished goods just in time to be sold, sub assemblies just in time to be assembled into finished goods, fabricated parts just in time to go into sub assemblies and purchased materials just in time to be transformed into fabricated parts'.

(c) Demand Stimulation :

Options for situations in which demand needs to be increased in order to match capacity include:

1. **Pricing** - Varying (lower) pricing to increase demand in periods when demand is less than peak. For example, matinee prices for movie theaters, off-season rates for hotels, night time rates for mobile telephone service, and off-season pricing for items that experience seasonal demand.
2. **Promotion** - Advertising, direct marketing, bulk purchase discounts, bonus/free offers and other forms of promotion are used to shift demand.
3. **Back ordering** - By postponing delivery on current orders demand is shifted to period when capacity is not fully utilized. This is really just a form of smoothing demand. Service industries are able to smooth demand by taking reservations or by making appointments in an attempt to avoid walk-in customer. Some refer to this as "partitioning" demand.
4. **New demand creation** - A new, but complementary demand is created for a product or service. When restaurant customers have to wait, they are frequently diverted into a complementary (but not complimentary) service, the bar. Other examples include the addition of video arcades within movie theaters, and the expansion of services at convenience stores.

(d) Level Strategy :

A level strategy seeks to produce an aggregate plan that maintains a steady production rate and/or a steady employment level. In order to satisfy changes in customer demand, the firm must raise or lower inventory levels in anticipation of increased or decreased levels of forecast demand. The firm maintains a level workforce and a steady rate of output when demand is somewhat low. This allows the firm to establish higher inventory levels than are currently needed. As demand increases, the firm is able to continue a steady production rate/steady employment level, while allowing the inventory surplus to absorb the increased demand.

A second alternative would be to use a backlog or backorder. A backorder is simply a promise to deliver the product at a later date when it is more readily available, usually when capacity begins to catch up with diminishing demand. In essence, the backorder is a device for moving demand from one period to another, preferably one in which demand is lower, thereby smoothing demand requirements over time. A level strategy allows a firm to maintain a constant level of output and still meet demand. This is desirable from an employee relations standpoint. Negative results of the

level strategy would include the cost of excess inventory, subcontracting or overtime costs, and backorder costs, which typically are the cost of expediting orders and the loss of customer goodwill.

Q6. Discuss some mathematical techniques that can be used in aggregate planning applications.

Answer 6.

The following are some of the better known mathematical techniques that can be used in more complex aggregate planning applications :

Linear Programming :

Linear programming is an optimization technique that allows the user to find a maximum profit or revenue or a minimum cost based on the availability of limited resources and certain limitations known as constraints. A special type of linear programming known as the Transportation Model can be used to obtain aggregate plans that would allow balanced capacity and demand and the minimization of costs.

However, few real-world aggregate planning decisions are compatible with the linear assumptions of linear programming. *Supply Chain Management: Strategy, Planning and Operation*, by Sunil Chopra and Peter Meindl, provides an excellent example of the use of linear programming in aggregate planning.

Mixed-integer Programming :

For aggregate plans that are prepared on a product family basis, where the plan is essentially the summation of the plans for individual product lines, mixed-integer programming may prove to be useful. Mixed-integer programming can provide a method for determining the number of units to be produced in each product family.

Linear Decision Rule :

Linear decision rule is another optimizing technique. It seeks to minimize total production costs (labor, overtime, hiring/lay off, inventory carrying cost) using a set of cost-approximating functions (three of which are quadratic) to obtain a single quadratic equation. Then, by using calculus, two linear equations can be derived from the quadratic equation, one to be used to plan the output for each period and the other for planning the workforce for each period.

Management Coefficients Model :

The management coefficients model, formulated by E.H. Bowman, is based on the suggestion that the production rate for any period would be set by this general decision rule:

$$P_t = aW_{t-1} + bI_{t-1} + cF_{t+1} + K, \text{ where}$$

P_t = the production rate set for period t

W_{t-1} = the workforce in the previous period

I_{t-1} = the ending inventory for the previous period

F_{t+1} = the forecast of demand for the next period

a , b , c , and K are constants

It then uses regression analysis to estimate the values of a , b , c , and K . The end result is a decision rule based on past managerial behavior without any explicit cost functions, the assumption being that managers know what is important, even if they cannot readily state explicit costs. Essentially, this method supplements the application of experienced judgment.

Search Decision Rule :

The search decision rule methodology overcomes some of the limitations of the linear cost assumptions of linear programming. The search decision rule allows the user to state cost data

inputs in very general terms. It requires that a computer program be constructed that will unambiguously evaluate any production plan's cost. It then searches among alternative plans for the one with the minimum cost. However, unlike linear programming, there is no assurance of optimality.

Simulation :

A number of simulation models can be used for aggregate planning. By developing an aggregate plan within the environment of a simulation model, it can be tested under a variety of conditions to find acceptable plans for consideration. These models can also be incorporated into a decision support system, which can aid in planning and evaluating alternative control policies. These models can integrate the multiple conflicting objectives inherent in manufacturing strategy by using different quantitative measures of productivity, customer service, and flexibility.

Functional Objective Search Approach :

The functional objective search (FOS) system is a computerized aggregate planning system that incorporates a broad range of actual planning conditions. It is capable of realistic, low-cost operating schedules that provide options for attaining different planning goals. The system works by comparing the planning load with available capacity. After management has chosen its desired actions and associated planning objectives for specific load conditions, the system weights each planning goal to reflect the functional emphasis behind its achievement at a certain load condition. The computer then uses a computer search to output a plan that minimizes costs and meets delivery deadlines.

Q7. What is MRP II and what are the essential elements of it?**Answer 7.**

Manufacturing Resource Planning (MRP II) is a computer based system designed to manage all the resources of a manufacturing organization. It acts as a planning and scheduling system, linking manufacturing with the sales and finance departments and providing tools for joint decision making among all three departments.

The essential elements of MRP II system are as follows :

- Demand forecast : Which takes into account firm orders and sales forecasts.
- Production planning : Which converts the demand forecast into a broad statement of output requirements and the necessary production programme.
- Resource planning : Which determines the manufacturing resources (materials and bought-in-components etc.) required to meet the production programme.
- Rough-cut capacity planning : Which is used to test the feasibility of meeting the production programme, taking into account the capacity available.
- Master production schedule : Which is prepared on the basis of the information obtained from the demand forecasting, production planning, resource planning and rough-cut capacity planning processes.
- Bills of materials : Which maintain the basic data for defining product i.e., lists of the components and material required to produce an end product or assembly.
- Materials requirement planning : Which determines component and material requirements on the basis of information from the master production schedules and the purchasing and inventory control function.
- Detailed material and capacity plans : Which set out the detailed schedules for providing material and capacity as derived from the material requirement plans and detailed capacity planning – only if capacity is available is the plan allowed to proceed.

- Shop and purchase order release : Which activate production and purchasing.
- Shop-floor control : Which monitors production against the plan and feeds back which enables the master production schedule and capacity and material plans to be updated.
- Purchase and Inventory control : Which monitors purchasing against the material plans and feeds back to the master production schedules and materials plans to enable updating to take place as required. Inventory control are also maintained on the basis of shop-floor usage.

Q8. ABC Ltd. operates a simple chemical process to convert a single material into three separate items, referred to here as X, Y and Z. All three end products are separated simultaneously at a single split-off point.

Product X and Y are ready for sale immediately upon split off without further processing or any other additional costs. Product Z, however, is processed further before being sold. There is no available market price for Z at the split-off point.

The selling prices quoted here are expected to remain the same in the coming year. During 2008-09, the selling prices of the items and the total amounts sold were:

X – 186 tons sold for Rs. 1,500 per ton

Y – 527 tons sold for Rs. 1,125 per ton

Z – 736 tons sold for Rs. 750 per ton

The total joint manufacturing costs for the year were Rs. 6,25,000. An additional Rs. 3,10,000 was spent to finish product Z.

There were no opening inventories of X, Y or Z, at the end of the year, the following inventories of complete units were on hand:

X 180 tons

Y 60 Tons

Z 25 tons

There was no opening or closing work-in-progress.

Required:

- (i) Compute the cost of inventories of X, Y and Z for Balance Sheet purposes and cost of goods sold for income statement purpose as of March 31, 2009, using:**
 - (a) Net realizable value (NRV) method of joint cost allocation**
 - (b) Constant gross-margin percentage NRV method of joint-cost allocation.**
- (ii) Compare the gross-margin percentages for X, Y and Z using two methods given in requirement (i).**

Answer 8.

(i) (a) **Statement of Joint Cost allocation of inventories of X, Y and Z for Balance Sheet purposes**
(By using net realisable value method)

	Products			
	X Rs.	Y Rs.	Z Rs.	Total Rs.
Final sales value of total production (Refer to working note 1)	5,49,000 (366 tons × Rs. 1,500)	6,60,375 (587 tons × Rs. 1,125)	5,70,750 (761 tons × Rs. 750)	17,80,125
Less: Additional cost	—	—	3,10,000	3,10,000
Net realisable value (at split-off point)	5,49,000	6,60,375	2,60,750	14,70,125
Joint cost allocated (Refer to working note 2)	2,33,398	2,80,748	1,10,854	6,25,000

Cost of goods sold for income statement purpose as of March 31,2009

(By using net realisable value method)

	Products			
	X Rs.	Y Rs.	Z Rs.	Total Rs.
Allocated joint cost	2,33,398	2,80,748	1,10,854	6,25,000
Additional costs	—	—	3,10,000	3,10,000
Cost of goods available for sale (CGAS)	2,33,398	2,80,748	4,20,854	9,35,000
Less : Cost of ending inventory	1,14,785	28,692	13,846	1,57,323
X : $\left[\frac{49.18\%}{100} \right] \times (\text{CGAS})$ Y : $\left[\frac{10.22\%}{100} \right] \times (\text{CGAS})$ Z : $\left[\frac{3.29\%}{100} \right] \times (\text{CGAS})$ (Refer to working note 1)				
Cost of goods sold	1,18,613	2,52,056	4,07,008	7,77,677

Income Statement

(Showing gross margin and gross margin percentage)

(By using net realisable value method)

	Products			
	X Rs.	Y Rs.	Z Rs.	Total Rs.
Sales revenue (Rs.)	2,79,000 (186 tons × Rs. 1,500)	5,92,875 (527 tons × Rs. 1,125)	5,52,000 (736 tons × Rs. 750)	14,23,875
Less: Cost of goods sold (Rs.)	1,18,613	2,52,056	4,07,008	7,77,677
Gross margin (Rs.)	1,60,387	3,40,819	1,44,992	6,46,198
Gross margin (%)	57.49%	57.49%	26.26%	45.38%

(b) Statement of joint cost allocation of inventories of X, Y and Z for Balance sheet purposes
(By using constant gross margin percentage net-realisable value method)

	Products			
	X Rs.	Y Rs.	Z Rs.	Total Rs.
Final sales value of total production	5,49,000	6,60,375	5,70,750	17,80,125
Less: Gross margin	2,60,641	3,13,517	2,70,967	8,45,125
(Refer to working note 3)	2,88,359	3,46,858	2,99,783	9,35,000
Less: Additional Cost	—	—	3,10,000	3,10,000
Joint cost allocated	2,88,359	3,46,858	(10,217)	6,25,000

Note : The negative joint cost allocation to product Z illustrates one 'unusual' feature of the constant gross margin NRV method.

Cost of goods sold for income statement purpose
(By using constant gross margin percentage net-realisable value method)

	Products			
	X Rs.	Y Rs.	Z Rs.	Total Rs.
Allocated joint cost	2,88,359	3,46,858	(10,217)	6,25,000
Cost Additional			3,10,000	3,10,000
Cost of goods available for sale (CGAS)	2,88,359	3,46,858	2,99,783	9,35,000
Less: Cost of ending inventory	1,41,815	35,449	9,863	1,87,127
X : $\left[\begin{matrix} 49.18\% \\ 10.22\% \\ 3.29\% \end{matrix} \right] \times \text{CGAS}$				
Cost of goods sold	1,46,544	3,11,409	2,89,920	7,47,873

Income Statement

(Showing gross margin and gross margin percentage by using constant gross margin percentage NRV method)

	Products			
	X Rs.	Y Rs.	Z Rs.	Total Rs.
Sales revenue (Rs.)	2,79,000	5,92,875	5,52,000	14,23,875
Less: Cost of goods sold (Rs.)	1,46,544	3,11,409	2,89,920	7,47,873
Gross margin (Rs.)	1,32,456	2,81,466	2,62,080	6,76,002
Gross margin (%)	47.475%	47.475%	47.478%	47.478%

(ii) Comparative statement of gross percentage for X, Y and Z

(Using net realisable value and Constant gross margin percentage NRV methods)

Method	Product gross margin percentage		
	X	Y	Z
Net realisable	57.49	57.49	26.26
Constant gross margin percentage NRV	47.48	47.48	47.48

Working notes :**(i) Total production of three products for the year 2002-2003:**

Items/Products	Quantity sold in tones	Quantity of ending inventory in tons	Total production	Ending inventory percentage
(1)	(2)	(3)	(4) = [(2) + (3)]	(5) = (3) / (4)
X	186	180	366	49.18
Y	527	60	587	10.22
Z	736	25	761	3.29

(ii) Joint cost apportioned to each product:

$$\frac{\text{Total joint cost}}{\text{Total net realisable value}} \times \text{Net realisable value of each product}$$

$$\text{Joint cost of product X} = \frac{\text{Rs. 6,25,000}}{\text{Rs. 14,70,125}} \times \text{Rs. 5,49,000} = \text{Rs. 2,33,399}$$

Similarly, the joint cost of inventories of products Y and Z comes to Rs. 2,80,748 and Rs. 1,10,854 respectively.

(iii) Gross margin percentage :

	Rs.
Final sales value production	17,80,125
Less : Joint cost and additional costs (Rs. 6,25,000 + Rs. 3,10,000)	9,35,000
Gross margin	8,45,125
Gross margin percentage (Rs. 8,45,125 / Rs. 17,80,125) × 100	47.4756%

Q9. A Modern Packing Corporation specialises in the manufacture of one-liter plastic bottles. The firm's customers include dairy processors, fruit juice manufactures and manufactures of edible oils. The bottles are produced by a process called blow moulding. A machine heats plastic to the melting point. A bubble of molten plastic is formed inside a mould, and a jet of hot air is forced into the bubble. This blows the plastic into the shape of the mould. The machine releases the moulded bottle, an employee trims off any flashing (excess plastic around the edge), and the bottle is complete.

The Firm has four moulding machines, each capable of producing 100 bottles per hour. The firm estimates that the variable cost of producing a plastic bottle is 20 paise. The bottles are sold for 50 paise each.

Management has been approached by a local toy company that would like the firm to produce a moulded plastic toy for them. The toy company is willing to pay Rs. 3.00 per unit for the toy. The variable cost of manufacture the toy will be Rs.2.40. In addition, Modern Packing Corporation would have to incur a cost of Rs.20,000 to construct the needed mould exclusively for this order. Because the toy uses more plastic and is of a more intricate shape than a bottle, a moulding machine can produce only 40 units per hour. The customer wants 1,00,000 units. Assume that Modern Packing Corporation has the total capacity of 10,000 machine hours available during the period in which the toy company wants the delivery of toys. The firm's fixed costs, excluding the costs to construct the toy mould, during the same period will be Rs. 2,00,000.

Required :

- If the management predicts that the demand for its bottles will require the use of 7,500 machine hours or less during the period, should the special order be accepted? Give the reasons.
- If the management predicted that the demand for its bottles would be higher than its ability to produce bottles, should the order be accepted? Why?
- The management has located a firm that has just entered the moulded plastic business. The firm has considerable excess capacity and more efficient moulding machines and is willing to subcontract the toy job, or any portion of it for Rs. 2.80 per unit. It will construct its own toy mould. Determine Modern Packing Corporation's minimum expected excess machine hour capacity needed to justify producing any portion of the order itself rather than subcontracting it entirely.
- The management predicated that it would have 1,600 hours of excess machine hour capacity available during the period. Consequently, it accepted the toy order and subcontracted 36,000 units to the other plastic company. In fact demand for bottles turned out to be 9,00,000 units for the period. The firm was able to produce only 8,40,000 units because it had to produce the toys. What was the cost of the prediction error failure to predict demand correctly?

Solution :

Contribution from bottle per hour	$[100(0.5-0.2)] = \text{Rs. } 30$
Contribution from toy per hour	$[40(3.0-2.4)] = \text{Rs. } 24$

- When the demand for the bottles is 7500 or less hours, it is better to accept, toy order because it gives minimum additional profit of Rs. 40000 $[(10,000-7,500) \times 24-20,000]$
- When the capacity for bottles is more than 7500 hours, the toy order should not be accepted because the contribution per hour of bottle Rs. 30, is more than the contribution per hour of toy Rs. 24
- The level at which it is necessary to sub contract the toy order is $[20000/(2.8-2.4)] = 50000$ units
- Computation of cost of prediction error

I) Statement showing computation of profit if 36000 toys are given for sub contract

	Bottles	Toy Manufacture	Toy Sub contract	Total
i. No. of units	840,000.00	64,000.00	36,000.00	
ii. Contribution per unit	0.30	0.60	0.20	
iii. Total contribution	252,000.00	38,400.00	7,200.00	297,600.00
iv. Fixed cost	200,000.00	20,000.00		220,000.00
v. Profit	52,000.00	18,400.00	7,200.00	77,600.00

II) Computation of profit at actual position

	Bottles	Toys	Total
i. No. of units	900,000.00	100,000.00	
ii. Contribution per unit	0.30	0.20	
iii. Total contribution	270,000.00	20,000.00	290,000.00
iv. Fixed cost	200,000.00		200,000.00
v. Profit	70,000.00	20,000.00	90,000.00
Therefore cost of prediction error	(90,000-77600)	Rs. 12,400	

Q10. Indo Gulf Fertilizers Ltd. supports the concept of the terotechnology or life cycle costing for new investment decisions covering its engineering activities.

The company is to replace a number of its machines and the Production Manager is to run between the "X" machine, a more expensive machine with a life of 12 years, and the "W" machine with an estimated life of 6 years. If the "W" machine chosen it is likely that it would be replaced at the end of 6 years by another "W" machine. The pattern of maintenance and running costs differs between the two types of machine and relevant data are shown below :

(Rs.)

Particulars	X	W
Purchase price	19,000	13,000
Trade-in-value	3,000	3,000
Annual repair costs	2,000	2,600
Overhead costs (in 8th & 4th year respectively)	4,000	2,000
Estimated financing costs averaged over machine life (p.a.)	10%	10%

You are required to recommend, with supporting figures, which machine to purchase, stating any assumptions made.

Answer 10.**Machine X – Life 12 years**

	Year	Cost (Rs.) factor	Discount cost (Rs.)	Discounted
Purchase price	0	19,000	1.00	19,000
Overhead cost	8	4,000	0.47	1,880
Trade-in-value	12	(3,000)	0.32	(960)
Annual repair cost	1-12	2,000	6.81	13,620
				33,540

Annualized equivalent = Rs. 33,540 / 6.81 = Rs. 4,925

Machine W – Life 6 years

	Year	Cost (Rs.) factor	Discount factor	Discounted cost (Rs.)
Purchase price	0	13,000	1.00	13,000
Overhead cost	4	2,000	0.68	1,360
Trade-in-value	6	(3,000)	0.56	(1,680)
Annual repair cost	1-6	2,600	4.36	11,336
				24,016

Annualised equivalent = Rs. 24,016 / 4.36 = Rs. 5,508

Recommendation – Purchase Machine "X"

Assumptions :

- (a) Same performance, capacity and speed
- (b) No inflation
- (c) 12 year-estimates are as accurate as 6-years estimates
- (d) Cash flow at the year end.

Q11. SVA Ltd. is preparing Budget for 2009. Data relating to sales, prices and costs are as follows:

Sales Price	Rs. 20.00 per unit
Variable Cost	Rs. 12.00 per unit
Fixed Costs	Rs. 2,00,000 per year

Sales forecasts have been prepared which disclose the following :

Quantity	Probability	Quantity	Probability
15,000	10%	35,000	30%
20,000	10%	40,000	10%
25,000	10%	45,000	10%
30,000	20%		

Required :

- (a) What is the Break Even Quantity?
- (b) How many units must be sold to:
 - (i) earn a profit of Rs. 60,000
 - (ii) incur a loss of Rs. 50,000

- (c) Based on the sales forecast, what is the probability that the firm can break-even?
 (d) What are the probabilities of achieving sales volume involved in part (b)?

Solution :

- (a) Break Even Quantity = 25,000 units $\left[\frac{2,00,000}{(20.00 - 12.00)} \right]$
- (b) (i) 32,500 units $\left[\frac{(2,00,000 + 60,000)}{(20.00 - 12.00)} \right]$ (ii) 18,750 units $\left[\frac{(2,00,000 - 50,000)}{(20.00 - 12.00)} \right]$
- (c) Probability = 80%
 Units = 25,000 $\times$ 80% = 20,000
- (d) (i) 50% (ii) 10%.

Q12. A company has accepted an order for making 15 items of a specialized machine at a price of Rs. 4 lacs each. The delivery is to be completed within 4 months. The company works 23 days a month and the normal direct wages per day amount to Rs. 10,000. However, in case of need, the company can work over time upto 8 days during the said period at double the normal rate of wages. Overheads amount to Rs. 12,000 per normal working day but no overheads are charged on overtime working days. The material cost is Rs. 2,40,000 per machine. The company has estimated that it will take 10 working days to manufacture the first machine. The company is expected to experience a learning effect of 90% ($b = 0.152$). The contract stipulates a penalty of Rs. 40,000 per machine delivered beyond the schedule of 4 months.

You are required to calculate the costs and advise the company whether it is preferable to work only during normal working days and pay penalty for any delayed delivery of the machines or to work overtime to avoid paying penalty.

Answer 12.

Working days 23 p.m. $\times$ 4	=	92 days
Time per machine	=	10 days
Learning curve	=	90%
Average time for		
15 machines	$15 \times 10 \times 15^{-0.152}$	= 99.4 days
14 machines	$14 \times 10 \times 14^{-0.152}$	= 93.7 days
13 machines	$13 \times 10 \times 13^{-0.152}$	= 88.0 days

So 13 machines can be supplied in time

The company can work overtime or supply late with penalty

Alternative I – Profitability statement if worked overtime for balance 2 machines

			Rs.
Direct materials		(15 $\times$ 2,40,000)	36,00,000
Direct labour	Normal	(92 days $\times$ 10,000)	9,20,000
	Overtime	(7.4 days $\times$ 20,000)	1,48,000
Overheads		(92 days $\times$ 12,000)	11,04,000
Total cost			57,72,000
Profit			2,28,000
Sales			60,00,000

Alternative II – Profitability statement if supplied late with penalty

Direct materials	(15 × 2,40,000)	36,00,000
Direct labour	(99.4 days × 10,000)	9,94,000
Overheads	(92 days × 12,000)	11,04,000
Penalty	(2 × 40,000)	80,000
Total cost		<u>57,78,000</u>
Profit		<u>2,22,000</u>
Sales		60,00,000

Analysis : It is suggested to work overtime to maximize profit.

Q13. State the areas in which the application of learning curve theory can help a manufacturing organization?**Answer 13.**

The applicability of learning curve is more important in cases where the labour input in an activity is large and the activity is complex. The following are the areas where the effects of learning curve would be useful to decision making in a manufacturing organization :

- **Pricing decision** – Since learning curve permit better cost prediction, it seems that they should be employed in pricing decision.
- **Work scheduling** – Learning curve increases a firm's ability to predict their required labour input and make it possible to forecast labour needs.
- **Capital budgeting** – One of the most important aspects in capital budgeting problems is the amount of cash flows. The learning curve suggests that unit costs are likely to begin high and reducing afterwards.
- **Overtime decisions** – Hiring more workers is not likely to be an easily reversible decision. Hence, if an organization is near the beginning its learning curve, it prefers to work overtime rather than hire additional workers who will not be needed later.
- **Fixation of pay scales** – In fixing pay scales and production bonus, the time needed to learn production process should be allowed for in calculating the wages and bonus for a period. The wage incentive schemes must recognize the learning curve i.e., the employees will need to be compensated during the early stages of learning for the lower than normal level of performance. This is due to lack of familiarity in the early stages of production rather than any lack of motivation or ability.
- **Cash budgets** – Since learning effect reduces unit variable costs as more units are produced, it should be allowed for in cash flow projections.
- **Direct costs** – The learning curve applies to an industry where there is a high labour turnover or when products and process are subject to frequent changes. As the labour hours or cost is reduced for repeat orders, a knowledge of learning curve helps in direct labour budget.
- **Setting of standard costs** – If the learning phase is not recognized an incorrect standard may be established. When cumulative output is low the standard cost is high, resulting in favourable variances. The converse of this applies when cumulative output is high.

Q14. Short Notes :

- (a) Backflush accounting
- (b) Kaizen Costing
- (c) Value Chain Management
- (d) Margin of Safety

Answer 14.**(a) Backflush accounting :**

Backflush accounting is defined as 'a cost accounting system which focuses on the output of the organization and then work backwards to allocate costs between cost of goods sold and inventory'. In essence, backflush accounting is a simpler bookkeeping system designed to reflect key aspects of JIT system i.e. little or no work-in-progress and demand pull.

There are several variants of backflush accounting (BFA), a popular one being the replacement of separate raw material and WIP accounts with a single account; Raw and In Process (RIP) account. When items are sold the standard cost for the materials in the finished goods would be credited (or back flushed) to the RIP account. All conversion costs (labour and materials) would be applied to the cost of finished goods production, none would be applied to WIP.

(b) Kaizen Costing :

Kaizen costing is a modification of standard costing which is essential to realize the planned cost reductions in continuous time. Kaizen costing is a Japanese contribution to cost accounting. Kaizen costing is continuous improvement applied to cost reduction in the manufacturing stage of a product's life. Like that of standard costing programme, the aim of Kaizen costing is to remove inefficiencies from production processes.

Kaizen costing tracks the cost reduction plans on a monthly basis. The Kaizen costing targets are expressed in the physical resources terms. If the head of a group fails to achieve the Kaizen costing target by 1 percent, review by senior will start. Resource consumption is so tightly controlled in many Japanese firms. Thus the planned cost reductions are planned and monitored through Kaizen cost targets in terms of physical resources.

While implementing the concept of Kaizen, following few rules are to be remembered :

- List down your own problems.
- Grade your problems as to minor, difficult and major.
- Select the smallest minor problem and start with it. After tackling this, move on to next graded problem and so on.
- Know and always remember, improvement is a part of daily routine.
- Never accept status quo.
- Never reject any idea before trying it.
- Share the experiments with colleagues.
- Eliminate already tried but failed experiments, while sharing the problems with your colleagues.
- Never hide problems, always highlight them.

(c) Value Chain Management :

Value chain management (VCM) is a solution for smoothening the interaction between all partners of an enterprise, suppliers, dealers, bankers etc. VCM goes beyond supply chain management to bring synergy between business partner by way of providing business and knowledge information in the effective manner to help achieve business targets. There are three kinds of partners among whom a company try to build synergy.

- One is the normal supply chain management partners – suppliers, suppliers to suppliers, dealers, customers etc.
- The second important partner category is the transporter who transports raw material and finished goods. The transporters play an important role in value chain.
- The third important category of partners are service providers and banks.

(d) Margin of Safety :

The margin of safety refers to sales in excess of the break-even volume. It represents the difference between sales at a given activity level and sales at break-even point. It is important that there should be a reasonable margin of safety to run the operations of the company in profitable position. A low margin of safety usually indicates high fixed overheads so that profits are not made until there is a high level of activity to absorb the fixed costs. A margin of safety provides strengths and stability to a concern.

The margin of safety is an important measure, especially in times of receding sales, to know the real position to operate without incurring losses and to take steps to increase the margin of safety to improve the profitability.

Margin of safety is calculated by using the following formulae :

$$\begin{aligned}\text{Margin of safety} &= \text{Actual sales} - \text{Break-even sales} = \frac{\text{Profit}}{\text{P/V Ratio}} \\ &= \frac{\text{Profit} \times \text{Selling Price p.u.}}{\text{Selling Price p.u.} - \text{Variable cost p.u.}}\end{aligned}$$

The higher the margin of safety, the better profitability of the product/ product line. The margin of safety can be improved by adopting any of the following steps :

- Keeping the break-even point at lowest level and try to maintain actual sales at highest level.
- Increase in sales volume.
- Increase in selling price.
- Change in product mix increasing contribution.
- Lowering fixed cost.
- Lowering variable cost.
- Discontinuance of unprofitable products in sales mix.

Q15. A company is organized into two large Divisions. Division 'A' produces a component which is used by Division 'B' in making a final product. The final product is sold for Rs. 400 each. Division A has a capacity to produce 2,000 units and the entire quantity can be purchased by Division B. The variable cost of Division A is Rs. 190/- per component.

Division A informed that due to installation of new machines, its depreciation cost had gone up and hence wanted to increase the price of the component to be supplied to Division B to Rs. 220. Division B, however can buy the component from the outside market at Rs. 200 each. The variable costs of Division B in manufacturing the final product by using the component is Rs. 150 (excluding the component cost).

Present statement indicating the position of each Division and the company as a whole taking each of the following situations separately.

- (i) If there are no alternative use for the production facilities of A, will the company benefit if Division B buys from outside suppliers at Rs. 200 per component?

- (ii) If internal facilities of A are not otherwise idle and the alternative use of the facilities will give an annual cash operating saving of Rs. 30,000 to Division A, should Division B purchase the component from outside suppliers?
- (iii) If there are no alternative use for the production facilities of Division A and the selling price for the component in the outside market drops by Rs. 15, should Division B purchase from outside suppliers?
- (iv) What transfer price would you fix for the component in each of the above circumstances?

Answer 15.**(i) Statement of contribution****(a) When component is purchased by Division B from outside****(Rs.)**

Division A			Nil
Division B sales (2,000 × 400)		8,00,000	
Less : Cost of purchase (2,000 × 200)	4,00,000		
Variable Cost (2,000 × 150)	3,00,000	7,00,000	1,00,000
Company's total contribution			1,00,000

(b) When component is purchased from Division A by Division B

Division A			
Sales (2,000 × 220)		4,40,000	
Less : Variable cost (2,000 × 190)		3,80,000	60,000
Division B			
Sales (2,000 × 400)		8,00,000	
Less : Variable cost			
Purchase cost from Division A (2,000 × 220)	4,40,000		
Variable cost in Division B (2,000 × 150)	3,00,000	7,40,000	60,000
Company's total contribution			1,20,000

Thus, it will be beneficial for the company as a whole to ask Division B to buy the component from Division A.

(ii) Statement of total contribution if Division A could be put to alternative use :

Division A			
Contribution from alternative use of facilities			30,000
Division B			
Sales (2,000 × 400)		8,00,000	
Less : Variable cost			
Cost of purchase (2,000 × 200)	4,00,000		
Variable Cost (2,000 × 150)	3,00,000	7,00,000	1,00,000
Company's total contribution			1,30,000

The company's contribution when component is purchased from outside, shows an increase of Rs. 10,000 as compared to when there is inter departmental transfer. Hence, it will be beneficial to purchase the component from outside.

(iii) Statement of total contribution when component is available from outside at Rs. 185

Division A			Nil
Division B			
Sales (2,000 × 400)		8,00,000	
Less : variable cost			
Cost of purchase (2,000 × 185)	3,70,000		
Variable cost (2,000 × 150)	3,00,000	6,70,000	1,30,000
Company's total contribution			1,30,000

If the component is purchased by Division B from Division A, the contribution is only Rs. 1,20,000 as calculated under (i) above. Hence it will be beneficial to buy the component from outside.

(iv) Fixation of transfer price

- (a) When there are no alternative uses of production facilities of Division A
In such a case the variable cost i.e. Rs. 190 per component will be charged
- (b) If facilities of Division A can be put to alternative uses :
- | | | |
|------------------|---------|---------|
| Variable cost | Rs. 190 | |
| Opportunity cost | Rs. 15 | |
| Transfer price | | Rs. 205 |
- (c) If market price gets reduced to Rs. 185 and there is no alternative use of facilities of Division A
The variable cost of Rs. 190 per component should be charged.

Q16. (a) A factory engaged in manufacturing plastic buckets is working at 40% capacity and produces 10,000 buckets per month. The present cost break-up for one bucket is as under :

Materials	Rs. 20
Labour	Rs. 6
Overheads	Rs. 10 (60% fixed)

The selling price is Rs. 40 per bucket. If it is decided to work the factory at 50% capacity, the selling price falls by 3%. At 90% capacity, the selling price falls by 5% accompanied by a similar fall in the price of materials.

You are required to prepare a statement showing the profits at 50% and 90% capacities and also determine the break-even points at each of these production levels.

- (b) What is target costing and what are the stages to the methodology?**

Answer 16.(a)**Flexible budget**

Capacity level	40% Present	50%	90%
Production and sales (units)	10,000	12,500	22,500
Selling price (Rs.)	40.00	38.80	38.00
Sales (a)	4,00,000	4,85,000	8,55,000
Variable cost			
Materials @ Rs. 20 for 40% & 50%, @19 for 90%	2,00,000	2,50,000	4,27,500
Labour @ Rs. 6	60,000	75,000	1,35,000
Variable overheads (Rs. 10 × 40/100)	40,000	50,000	90,000
Total (b)	3,00,000	3,75,000	6,52,500
Contribution (a) – (b)	1,00,000	1,10,000	2,02,500
Less : Fixed overheads @ (Rs. 10 × 60/100 × 10,000 units)	60,000	60,000	60,000
Profit	40,000	50,000	1,42,500
Contribution per unit	10.00	8.80	9.00
Break even point (units) = $\frac{\text{Fixed Overhead}}{\text{Contribution per unit}}$	6,000	6,818	6,677

Answer 16. (b)

Target costing is defined 'as a cost management tool for reducing the overall cost of a product over its entire life cycle with the help of the production, engineering, R&D.'

The target cost is the estimated cost of a product that enables a company to remain and compete in the market in the long run. The idea of target costing, originally promoted in Japan, is about going upstream to achieve cost reduction. Target costing is not really a method of costing, but it is a technique used in cost management. The intent of target costing is to reduce cost, where reduction is aimed at the entire life cycle of any product. Target costing can also help in achieving certain broader objectives, such as, identifying and delivering various customer requirements in a product through effective management of different processes.

A firm's business plan and product market strategies provide the framework and basic guidelines for applying the target costing methodology. Specific steps involved in target costing may be summarized as follows :

- Determine customer wants precisely.
- Translate them into desired product performance feature.
- Estimate the proportion of value added by each feature and component.
- Choose a product design assures a targeted profit, and cost targets for each component in total.

- Choose manufacturing design that assure targeted costs.
- Choose suppliers that assure buying at targeted costs.
- After each cost review, conduct value engineering to reduce target costs.
- Monitor initial production to be sure that all product performance, cost, profit, targets are met.

Q17. The directors of ABC Ltd. manufactures three products A,B and C, have asked for advice on the product mix of the company. The following information is given :

		Products		
Particulars		A	B	C
Standard cost per unit :				
Direct material		20	60	40
Variable overhead		6	4	10
Direct labour :				
Department	Rate/ Hr.	Hrs.	Hrs.	Hrs.
1	Re. 1	28	16	30
2	Rs. 2	5	6	10
3	Re. 1	16	8	30
Current production p.a.		10,000	5,000	6,000
Selling price per unit Rs.		100	136	180
Forecast of sales for next year		12,000	7,000	9,000

Fixed overheads p.a. Rs. 4,00,000.

Further, the type of labour required by Dept. 2 is in short supply and it is not possible to increase the manpower of this department beyond its present level.

- (a) You are required to prepare a statement showing the most profitable mix of the products to be made and sold. The statement which should be presented in two parts should show :
- the profit expected on current budgeted production; and
 - the profit which could be expected if the most profitable mix was produced.
- (b) You are also required to bring out any problems which are likely to arise if the product mix in (a) (ii) above were to be adopted.

Answer 17.

(a) (i) Statement showing profit on current budgeted production

Products	A	B	C	Total
Units	10,000	5,000	6,000	
Sales (Rs.) (i)	<u>10,00,000</u>	<u>6,80,000</u>	<u>10,80,000</u>	<u>27,60,000</u>
Direct material	2,00,000	3,00,000	2,40,000	7,40,000

Direct wages :				
Dept 1	2,80,000	80,000	1,80,000	5,40,000
2	1,00,000	60,000	1,20,000	2,80,000
3	1,60,000	40,000	1,80,000	3,80,000
Variable overhead	60,000	20,000	60,000	1,40,000
Marginal cost (ii)	8,00,000	5,00,000	7,80,000	20,80,000
Contribution (i) – (ii)	2,00,000	1,80,000	3,00,000	6,80,000
Fixed overhead				4,00,000
Net profit				2,80,000

Particulars	A	B	C
Marginal cost (per unit)	80	100	130
Contribution (per unit)	20	36	50
Contribution (per hour of Dept 2)	4	6	5
Ranking	III	I	II

Since the key factor is labour hours, production hours should be applied for the products in the order B, C and A, as ranked above.

Total hours available in Dept. 2 on the basis of current production

A	(10,000 × 5)	50,000
B	(5,000 × 6)	30,000
C	(6,000 × 10)	<u>60,000</u>
Total hours		1,40,000

Reallocation on Hrs. available in Dept. 2

Product	Units	Hrs. per unit	Total hours
B	7,000	6	42,000
C	9,000	10	90,000
A	1,600	5	<u>8,000*</u>
			1,40,000

*balancing figure

(a) (ii) Statement of profit as per revised programme

Product	A	B	C	Total
Units	1,600	7,000	9,000	
Sales	1,60,000	9,52,000	16,20,000	27,32,000
Marginal costs	1,28,000	7,00,000	11,70,000	19,98,000
Contribution	32,000	2,52,000	4,50,000	7,34,000
Fixed cost				4,00,000
Net profit				3,34,000

(b) The following possible problems should be guarded against, before taking the above decision :

- (i) The demand for product A may be complementary to demand for the other products. If it is so, sales of B and C may fall with fall in demand of product A.
- (ii) Lower production of product A may adversely affect customers' preferences for other products.

Q18. TVS Ltd. is now considering the purchase of a new machine for Rs 350. The Directors feel quite confident that they can sell the goods produced by the machine so as to yield a yearly cash surplus of Rs 100. There is, however, some uncertainty as to the machine's working life. A recently published Trade Association survey shows that members of the association have among them owned 250 of these machines and have found the lives of the machine to vary as follows:

Number of years of machine life	Numbers of machines having given life
3	20
4	50
5	100
6	70
7	10
	<u>Σ = 250</u>

Assuming a discount rate of 10%, the net present value for each different machine life is as follows :

Machine Life	Net Present Value
3	(101)
4	(33)
5	29
6	86
7	137

As a Management Accountant, you are asked to advise whether the company should purchase a new machine or not.

Solution :

Life of machine	NPV	Probability	Expected NPV
3	(101)	0.08	(8.08)
4	(33)	0.20	(6.6)
5	29	0.40	11.6
6	86	0.28	24.08
7	137	0.04	5.48
Total			26.48

As there is the expected NPV of TVS Ltd. should go ahead with purchase of new machine.

Q19. The Himalaya Snow Co. Ltd. manufactures and sells direct to consumers 10,000 jars of "Himalaya Snow" per month at Rs. 1.25 per jar. The company's normal production capacity is 20,000 jars of snow per month. An analysis of costs for 10,000 jars show :

	Rs.
Direct material	1,000
Direct labour	2,475
Power	140
Miscellaneous supplies	430
Jars	600
Fixed expenses for manufacturing, selling & admin.	<u>7,955</u>
Total	<u>12,600</u>

The company has received an offer for the export under a different brand name of 1,20,000 jars per month at Re 0.75 a jar.

Write a short report on the advisability of accepting the offer.

Answer 19.

Statement showing profit and loss position with export order

	Present Position (Capacity 50%)	For Export Offer (Capacity 50%)	Total (Capacity 100%)
Sale units	10,000	10,000	20,000
Selling price	1.25	0.75	—

		Rs.		Rs.	Rs.
Sales value		12,500		7,500	20,000
Less : Marginal Cost :					
Direct material	1,000		1,000		
Direct labour	2,475		2,475		
Power	140		140		
Misc. supplies	430		430		
Jars	<u>600</u>		<u>600</u>		
		4,645		4,645	9,290
Contribution		7,855		2,855	10,710
Less : Fixed Costs					
Profit/(Loss)		7,955		—	7,955
		(-100)		(+2,855)	(+2,755)

As, the profit is increased by Rs. 2,855 on accepting the proposed offer, the proposal should be accepted. Before taking a final decision the following point, however, should be considered :

- The increase in cost on export order due to special packing, freight etc., and whether the Government will grant subsidy and provide for importation on raw materials on the basis of export,
- Whether cost will increase if the export orders are not received in future,

- (iii) Whether there will be any effect in home market in the long run for reduction in export price,
- (iv) As the present position is not prospective, the surplus capacity should be utilized for production of more profitable products.

Q20. (a) "Purpose of sensitivity analysis is to identify the critical variable in the project analysis" – Discuss !

(b) Vishal Ltd., has estimated the following sales and profit of a new product which it may decide to launch on to the market.

	Rs.	Rs.
Sales (4,000 × Rs. 4)		16,000
Variable Cost-materials	8,000	
Variable Cost-labour	<u>4,000</u>	<u>12,000</u>
		4,000
Incremental Fixed Costs		3,200
Profit		<u>800</u>

Make a Sensitivity Analysis based on the above data.

Answer 20. (a)

Sensitivity analysis is a term used to describe any technique whereby decision options are tested for their vulnerability to changes in any "variable" such as expected sales volume, selling price, material costs, labour costs etc. It is used to analyse the risk in short-term decision opportunities.

The useful approaches to sensitivity analysis are :

- (i) The best possible / worst possible approach,
- (ii) To estimate by how much costs and revenue would need to differ their estimated values before the decisions would change,
- (iii) To estimate whether a decision would change if estimated costs are x% higher than the estimated, or estimated revenues are y% lower than the estimated.

Answer 20. (b)

A Sensitivity analysis can be made as follows :

- (i) If increment fixed costs are more than 25% above the estimate, the project will make a loss,
- (ii) If unit costs of material are more than 10% (i.e. over Rs. 8,800) the project will make a loss,
- (iii) Similarly, if labour costs increase by more than 20% above the estimate, the project will make a loss,
- (iv) If selling price is reduced by more than 5%, the project will make a loss,
- (v) If sales are reduced more than 20% of estimated sales of 4,000 units, the project will make a loss.

Out of the above, the selling price is most sensitive as for the slight reduction by just more than 5% will make a project loss. Hence, this area requires more attention (in the form of market research, etc.)

Q21. Patients arriving at a village dispensary are treated by a doctor on a first-come-first serve basis. The inter arrival time of the patients is known to be uniformly distributed between 0 and 80 minutes, while their service time is known to be uniformly distributed between 15 and 40 minutes. It is desired to simulate the system and determine the average time a patient has to be in the queue for getting service and the proportion of time the doctor would be idle.

Carry out the simulation using the following sequences of random numbers. The numbers have been selected between 00 and 80 to estimate inter-arrival times and between 15 and 40 to estimate the service times required by the patients.

Series I	07	21	12	80	08	03	32	65	43	74
Series II	23	37	16	28	30	18	25	34	19	21

Solution :

Simulation of data at a village dispensary

No. of Patients	Inter arrival time Random No. (Minutes)	Entry Time in to queue (hrs)	Service Time Random No. (minutes)	Service Start time (hrs)	End time (hrs)	Waiting time of patient (minutes)	Idle time of doctor (minutes)
1	07	8.07	23	8.07	8.30	–	07
2	21	8.28	37	8.30	9.07	2	–
3	12	8.40	16	9.07	9.23	27	–
4	80	10.00	28	10.00	10.28	–	37
5	08	10.08	30	10.28	10.58	20	–
6	03	10.11	18	10.58	11.16	47	–
7	32	10.43	25	11.16	11.41	33	–
8	65	11.48	34	11.48	12.22	–	07
9	43	12.31	19	12.31	12.50	–	09
10	74	01.45	21	01.45	2.06	–	55
Total (in minutes)						129	115

Thus, Average waiting time of patient = $129 / 10 = 12.9$ minutes

and Average waiting time of doctor = $115 / 10 = 11.5$ minutes

Note : It has been assumed that starting time be 8.00 A.M.

Q22. A chemical factory produces four products from a single raw material. The cost of raw material for a year is Rs. 67,000 and the initial processing costs amounted to Rs. 1,28,200. All the four products viz; A,B,C and D are produced simultaneously at a single split off point. Product C is sold immediately without any further processing. A,B, and D are processed further.

The output, sales and further processing costs are :

Product	Output in Units	Sales (Rs)	Further Processing Cost (Rs)
A	4,00,000	1,92,000	40,000
B	89,725	58,000	32,000
C	5,000	8,000	–
D	9,000	60,000	1,000

If these products were sold out at the split off point, the prices attained per unit would be A = Rs 0.32, B = Rs 0.40, C = Rs 1.60 & D = Rs 5.00

Using the concepts of relevancy of costs and differential costs, advise your management whether further processing should be undertaken or not!

Solution :

Statement showing computation of profit before further processing:

Particulars	A	B	C	D	Total
No. of units	4,00,000	89,725	5,000	9,000	–
Selling price	0.32	0.40	1.60	5.00	–
Sales (NRV)	1,28,000	35,890	8,000	45,000	2,16,890
Joint cost	1,15,199	32,301	7,200	40,500	1,95,200
Profit / (Loss)	12,801	3,589	800	4,500	21,690

Statement showing profit after further processing:

Particulars	A	B	C	D	Total
Final sales	1,92,000	58,000	8,000	60,000	3,18,000
Further processing costs	40,000	32,000	–	1,000	73,000
Sale value at split off	1,52,000	26,000	8,000	59,000	2,45,000
Joint cost	1,21,104	20,715	6,374	47,007	1,95,200
Profit / (Loss)	30,896	5,285	1,626	11,993	49,800

Statement showing computation of additional (cost) / profit:

Particulars	A	B	C	D	Total
Final sales	1,92,000	58,000	8,000	60,000	3,18,000
Sale value of split off	1,28,000	35,890	8,000	45,000	2,16,890
Additional sales	64,000	22,110	–	15,000	1,01,110
Further costs	40,000	32,000	–	1,000	73,000
Additional profit / (Loss)	24,000	(9890)	–	14,000	28,110

From the above computations, it is advisable to further process products A & D as there is additional profit and not to further process products B & C as there is no additional profit.

Q23. X Co Ltd. purchases a component A at a price of Rs 18 per unit. The management decides to manufacture the component at a marginal cost of Rs. 12 per unit with a processing time 4 hours in a particular machine. State whether the decision of the management is correct :

- (a) when there is spare capacity in the machine;
 (b) when the machine is at present working to the full capacity by manufacturing another product M with selling price Rs. 200, marginal cost 110 and processing time 40 hours.

Is the decision of the management correct?

Solution :

- (a) Where spare capacity exists-

The relevant cost of manufacture is Rs. 12 per unit.

The relevant cost of purchase is Rs. 18 per unit.

Thus, cost of manufacture being lower, the decision of the management is correct.

- (b) In this case, the relevant cost of manufacture will be-

	Per Unit
Variable cost of manufacture	12.00
Opportunity cost: 4 hours × (Rs. 200 – Rs. 110) / 40 hrs.	<u>9.00</u>
	<u>21.00</u>

As relevant cost of manufacture is higher than the relevant cost of purchase, the decision of the management is not correct.

Q24. ABC Ltd. makes two products A and B with same type of labour in a shop floor. Unit sales price and costs are as follows :

	Product A		Product B	
	Rs.	Rs.	Rs.	Rs.
Selling price		200		120
Direct material	120		48	
Direct labour	20		20	
Variable overhead	<u>10</u>	<u>150</u>	<u>10</u>	<u>78</u>
Contribution		50		42
Fixed overhead		<u>30</u>		<u>22</u>
Profit		<u>20</u>		<u>20</u>

Required :

- (i) Which products appear to be more profitable based on profit to sales ratio and P/V ratio.
 (ii) Find the added value and comment on the profitability based on contribution to added value ratio.

Solution :

(i)	Product A	Product B
Profit / Sales	10%	16.67%
P/V ratio (C/S)	25%	35%

From the above ratios it appears that product B is more profitable than product A.

(ii)	Product A	Product B
Selling price	200	120
Less- Material Cost	<u>120</u>	<u>48</u>
	<u>80</u>	<u>72</u>
Contribution / value added (50/80)	62.5%	(42/72) 58.3%

It is observed that contribution from Product A is higher (Rs. 50 compared to Rs. 42) and the added value is also higher (Rs. 80 per unit compared to Rs. 72). Since the same amount labour effort and overhead cost has gone into each product, product A must be more profitable than product B.

The profit to sales ratio and contribution to sales ratio are misleading because the selling price of each product is affected by the material cost of each. The higher price of product A is necessary to cover the higher material cost, and a better measure of profitability is the contribution to added value ratio. In this case, therefore, Product A is more profitable in terms of contribution to added value ratio.

Q25. R. Ltd. makes a single product which it sells for Rs. 40 each and has a variable cost per unit as follows —

	Rs.
Direct material cost	8
Direct wages (2 hours)	12
Variable overhead	<u>4</u>
	<u>24</u>

There is a heavy demand for a product. The labour force is currently working at full capacity and no overtime work is possible.

A customer is willing to pay Rs. 11,000 for a special offer which will require Rs. 4,000 for direct materials and 500 hours for direct labour.

Advise the R. Ltd. as to whether the special order should be accepted.

Solution :

Here, labour is a limiting factor. If special offer is accepted, there will be loss of contribution for 500 hours from the standard product.

$$\text{Contribution per direct labour hour} = \text{contribution per unit/labourhours} = \frac{(\text{Rs. } 40 - \text{Rs. } 24)}{2} = \text{Rs. } 8.$$

Loss of contribution (or opportunity cost for 500 hours) is Rs. 4,000

		Rs.
Relevant revenue for special order		11,000
Relevant cost		
Direct materials	4,000	
Direct wages (500 hours × Rs. 6)	3,000	
Variable overhead (500 × Rs. 2)	1,000	
Opportunity cost	<u>4,000</u>	<u>12,000</u>
Loss in accepting the special order		<u>1,000</u>

Hence, R. Ltd. may be advised to reject the offer of special order.

Q26. Z Ltd. currently operates a single operation shift, which incurs costs and earns revenues as follows :

	Rs.	Rs.
Sales (20,000 units)		8,00,000
Direct materials	2,50,000	
Direct labour	2,00,000	
Variable overhead	<u>40,000</u>	<u>4,90,000</u>
Contribution		<u>3,10,000</u>
Fixed overhead		<u>2,10,000</u>
Profit		<u>1,00,000</u>

Sales demand exists for an extra 10,000 units (at the existing selling price) which could be made in the second shift.

Additional fixed overheads of Rs. 10,000 would be incurred, but a bulk purchased discount of 2% would be available on all quantities of material bought. The total direct labour costs in the second shift would be the same as in the first shift plus a second shift allowance of 10% of wages. Suggest the company as to whether the second shift be opened up?

Solution :

	Rs.	Rs.
Relevant revenue (10,000 × Rs. 40)		4,00,000
Relevant costs :		
Current cost of materials	2,50,000	
Total cost of materials including 2nd shift (30,000 × Rs. 12.50 × 0.98)	<u>3,67,500</u>	
Incremental materials cost	1,17,500	
Incremental labour cost (2,00,000 × 110%)	2,20,000	
Incremental variable overhead (10,000 × Rs. 2)	20,000	
Additional fixed overhead	<u>10,000</u>	<u>3,67,500</u>
Increase in profit from second shift		<u>32,500</u>

Hence, The extra shift will be profitable and may be recommended provided sales demand exists.

Q27. Division A is a profit centre which produces three products X, Y and Z. Each product has an external market.

	X Rs.	Y Rs.	Z Rs.
External market price per unit	48	46	40
Variable cost of production in division A	33	24	28
Labour hours required per unit in division A	3	4	2

Product Y can be transferred to Division B, but the maximum quantity that might be required for transfer is 300 units of Y.

	X	Y	Z
The maximum external sales are :	800 units	500 units	300 units

Instead of receiving transfers of Product Y from Division A, Division B could buy similar product in the open market at a slightly cheaper price of Rs. 45 per unit.

What should the transfer price be for each unit for 300 units of Y, if the total labour hours available in Division A are?

- (a) 3800 hours
- (b) 5600 hours.

Solution :

Computation of contribution per labour hour from external sales :

	X	Y	Z
Market price	48	46	50
Variable cost	33	24	28
Contribution	15	22	12
Labour hours required	3	4	2
Contribution per labour hour	5	5.50	6
Priority	III	II	I

Computation of transfer price when**(a) The capacity is 3800 hours :**

$$\begin{aligned}
 \text{Hours required for Z} &= 300 \times 2 = 600 \\
 \text{Y} &= 500 \times 4 = \underline{2000} \\
 &2600 \\
 \text{X} &= 800 \times 3 = \underline{2400} \\
 &5000
 \end{aligned}$$

The existing capacity is not sufficient to produce the units to meet the external sales. In order to transfer 300 units of Y, 1200 hours are required in which division A will give up the production of X to this extent.

Variable cost of Y 24

(+) contribution lost by giving up production of X to the extent of 1200 hours
 $= 1200 \times 5 = 6000$

$\therefore$ Opportunity cost per unit $= \left(\frac{6000}{300} \right)$ 20

Required Transfer price **44**

(b) If the capacity is 5600 hours :

Variable cost 24

Contribution cost of giving up X to the extent of 600 hours $= 600 \times 5 = 3000$

Opportunity Cost Per unit $= \left(\frac{3000}{300} \right)$ 10

Required Transfer price **34**

Q28. What is life cycle costing? Explain the stages in product life-cycle?**Answer28 :**

Life cycle costing is a technique which takes account of the total cost of owning a physical asset, or making a product, during its economic life. It includes the costs associated with acquiring, using, caring for and disposing of physical assets, including the feasibility studies, research, design,

development, production, maintenance, replacement and disposal, as well as support, training and operating costs generated by the acquisition, use, maintenance and replacement of permanent physical assets.

Stages in Product Life Cycle :

There are five distinct stages in the life cycle of a product as follows :

Introduction stage – Research and engineering skill leads to product development. The product is put on the market and its awareness and acceptance are minimal. Promotional costs will be high, sales revenue low and profits probably negative. The skill that is exhibited in testing and launching the product will rank high in this phase as critical factor in securing success and initial market acceptance. Sales of new products usually rise slowly at first.

Growth Stage – In the growth stage product penetration into the market and sales will increase because of the cumulative effects of introductory promotion, distribution. Since costs will be lower than in the earlier stage, the product will start to make a profit contribution. Following the consumer acceptance in the launch stage it now becomes vital or secure wholesaler / retailer support. But to sustain growth, consumer satisfaction must be ensured at this stage. If the product is successful, growth usually accelerates at some point, often catching the innovator by surprise.

Maturity Stage – This stage begins after sales cease to rise exponentially. The causes of the declining percentage growth rate the market saturation – eventually most potential customers have tried the product and sales settle at a rate governed by population growth and the replacement rate of satisfied buyers. In addition there were no new distribution channels to fill. This is usually the longest stage in the cycle, and most existing products are in this stage. The period over which sales are maintained depends upon the firm's ability to stretch the cycle by means of market segmentation and finding new uses for it.

Saturation stage – As the market becomes saturated, pressure is exerted for a new product and sales along with profit begin to fall. Intensified marketing effort may prolong the period of maturity, but only by increasing costs disproportionately.

Declining Stage – Eventually most products and brands enter a period of declining sales. This may be caused by the following factors :

- Technical advances leading to product substitution
- Fashion and changing tastes
- Exogenous cost factors will reduce profitability until it reaches zero at which point the product's life is commercially complete.

Q29. (a) Write a note on Total Quality Management

(b) Differentiate between Quality Planning, Quality Control & Quality Improvement.

Answer 29.

- (a) Quality is considered a by-product of the manufacturing system, i.e. each individual process has some variation that will lead to the production of some defective units. If the resulting defective rate is too high, compared to the established quality standards, quality inspectors will identify and send them back for rework. The approach is expensive and does not guarantee the desired quality, because quality maintenance and ensuring it self can not be inspected into a product. This approach assigns the responsibility for quality to quality control managers.

A more unlighted approach to quality emphasizes building quality into the product by studying and improving activities that affect quality, from marketing through design to manufacturing. This new approach is referred to as Total Quality Management (TQM).

It is an active approach encompassing a company-wide operating philosophy and system for continuous improvement of quality. It demands co-operation from everyone in the company, from the top management down to workers.

The principles of TQM are as follows:

- (i) Customer focus,
- (ii) Managerial Leadership,
- (iii) Belief in continuous improvement.
- (iv) The current thinking on TQM is moving from Quality of product and service to Quality of people to embrace also Quality of environment. ISO 14000 standard supports this.

(b) Difference between Quality Planning, Quality Control & Quality Improvement :

Quality Planning	Quality Control	Quality Improvement
Determine who are the Customers	Choose control subjects what to control?	Establish the infrastructure needed to secure annual quality improvement
Determine the needs of the Customers	Choose units of measure- ments-Evaluate Measurements	Identify the specific needs for improvement - the improvement projects
Develop product features that respond to the customer's needs.	Establish standards of performance	For each project establish a project team with clear responsibility for bringing the project to a successful conclusion
Develop processes that are able to product feature	Measure actual performance	Provide the resources, motivation and training needed by the teams to :
Transfer the resulting plans to the operating forces.	Interpret the difference (actual versus standard)	Diagnose the causes
	Take action on difference	Stimulate establishment of a remedy
		Establish controls to hold the gains

Q30 . Write Short Notes on:

- (a) Theory of Constraint
- (b) Balanced Score Card
- (c) 'Zero Defects' & "Right First Time" - Philip Crosby
- (d) Enterprise Risk Management
- (e) Crowned Prince Syndrome

Answer 30.**(a) Theory of Constraint :**

It describes methods to maximize operating income when faced with some bottleneck and some non-bottleneck operations. It defines three measurements :

- (a) Throughput contribution, equal to sales revenue minus direct materials cost.
- (b) Investments (inventory), equal to the sum of materials cost of direct materials inventory, W.I.P inventory and finished good inventory; R & D costs and costs of equipment and buildings.
- (c) Operating costs, equal to all operating costs (other than direct materials) incurred to earn throughput contribution. Operating costs include salaries and wages, rent, utilities and depreciation.

Increasing throughput and / or decreasing inventory or operating expenses should lead to the accomplishment of the firm's goal; to make money now and in future as well. Anything that prevents a firm from reaching this goal is labeled as a constraint (in the form of capacity, material, the market (demand), behaviour or even management policy).

Theory of Constraint thinking regards all progress toward the goal of making money as relating directly to management attention toward the constraint(s).

The five focusing steps are a tool developed to help systems deal with constraints :

- Step (i) Identify the system's constraints,
- Step (ii) Decide how to exploit the system's constraints,
- Step (iii) Subordinate everything else to the decisions made in step (ii),
- Step (iv) Elevate the system's constraints,
- Step (v) If a constraint is broken in step (iv), go back to step (i), but do not allow inertia to cause a new constraints.

(b) Balanced Score Card :

Balanced Score Card is a performance management and strategy development methodology that helps executives translate an organization's mission statement and overall business strategy into specific, qualifiable goals and monitors the organization's performance in terms of these goals. Balanced Score Card also aligns budgets to strategy and helps in developing an enterprise performance management system.

It is a set of financial and non-financial measures relating to company's critical success factors. As a management tool it helps companies to assess overall performance, improve operational processes and enable management to develop better plans for improvements. It offers managers a balanced view of their organization upon which they can base real change.

Balanced Score Card has the following four perspectives :

(a) Customer perspective :

To achieve the company's vision and strategy how should the company appear its customer?

(b) Internal business performance :

To satisfy the company's shareholders and customers and what business processes must the company excel?

(c) Learning and growth perspective :

To achieve the vision, how will the company sustain its ability to change and improve?

(d) Financial perspective :

To succeed financially how should the company appear to the company's share holders?

(c) **'Zero Defects' & "Right First Time"- Philip Crosby :**

Philip Crosby prompted the phrases, "Zero Defects" does not mean mistakes never happen, rather than there is no allowable number of errors built into a product or process and that it is to be got right first time. He believes that management should take prime responsibility for quality and worker only follow their managers' example.

His four absolute quality management criteria are :

- (i) Quality is conformance to requirements,
- (ii) Quality prevention is preferable to quality inspection,
- (iii) Zero defects is the quality performance standard,
- (iv) Quality is measured in monetary terms—the price of non-conformance.

Steps to quality improvement :

- (i) Committed to quality,
- (ii) Creation of quality improvement teams representing all the departments,
- (iii) Measure processes to determine current and potential quality issues,
- (iv) Calculate cost of (poor) quality,
- (v) Raise quality awareness of all employees,
- (vi) Take action to correct quality issues,
- (vii) Monitor progress of quality improvement,
- (viii) Train supervisors in quality improvement,
- (ix) Hold "Zero Defects" days,
- (x) Encourage employees to create their own quality improvement goals,
- (xi) Encourage employee communication with management about obstacles to quality,
- (xii) Recognize participants' effort,
- (xiii) Create quality councils,
- (xiv) Do it all over again — quality improvement does not end.

(d) **Enterprise Risk Management :**

As the field of risk management expanded to include managing financial, environmental, and technological risks, the role of risk managers grew to encompass an organization-wide approach known as enterprise risk management (ERM). This approach seeks to implement risk awareness and prevention programs throughout a company, thus creating a corporate culture, able to handle the risks associated with a rapidly changing business environment.

Enterprise risk management is a process, effected by an entity's board of directors, management and other personnel. It is being applied in strategy setting and across the

enterprise, designed to identify potential events that may affect the entity, and manage risk to be within its risk appetite, to provide reasonable assurance regarding the achievement of entity objectives.

The underlying premise of enterprise risk management is that every entity exists to provide value for its stakeholders. All entities face uncertainty, and the challenge for management is to determine how much uncertainty to accept as it strives to grow stakeholder value. Uncertainty presents both risk and opportunity, with the potential to erode or enhance value. Enterprise risk management enables management to effectively deal with uncertainty and associated risk and opportunity, enhancing the capacity to build value.

Value is maximized when management sets strategy and objectives to strike an optimal balance between growth and return goals and related risks, and efficiently and effectively deploys resources in pursuit of the entity's objectives.

(e) Crowned Prince Syndrome :

The first potential problem in succession planning is the crowned prince syndrome, which occurs when upper management only considers for advancement, those employees who have become visible to them. In other words, rather than looking at a wider array of individual employees and their capabilities, upper management focuses only on one person—the “crowned prince”. This person is often one who has been involved in high-profile projects, has a powerful and prominent mentor, or has networked well with organizational leaders. There are often employees throughout the organization who are capable of and interested in promotion who may be overlooked because of the more visible and obvious “crowned prince”, who is likely to be promoted even if these other employees are available. Not only are performance problems a potential outcome of this syndrome, but also the motivation of current employees may suffer if they feel that their high performance has been overlooked. This may result in turnover of high quality employees who have been overlooked for promotion.