

# MANAGEMENT SCIENCE

## Question I: Multiple Choice Questions

1. Which of the following is not a characteristic of a formal organisation?
  - (a) able to communicate with one another
  - (b) willing to act in an atmosphere of cooperation
  - (c) share a common implicit purpose
  - (d) share a common explicit purpose
2. The obligation on the part of the subordinate to complete the given job is called
  - (a) Authority
  - (b) Power
  - (c) Reliability
  - (d) Responsibility
3. The process of transferring authority from the top to the lower levels in the organization is called
  - (a) Authority
  - (b) Delegation
  - (c) Power
  - (d) Responsibility
4. What is the type of organization when the authority is delegated to the regional offices?
  - (a) centralized
  - (b) decentralized
  - (c) both
  - (d) none
5. Which of the following is not defined by V.A. Graicunas classification for superior-subordinate relationships?
  - (a) group relationships
  - (b) direct single relationships
  - (c) direct group relationships
  - (d) cross relationships
6. Which one of the following is a disadvantage for wide span of control?
  - (a) fewer levels of management
  - (b) difficult to supervise the subordinates directly

- (c) lower supervision costs
  - (d) fewer levels of decision making
7. Which one of the following is an advantage in narrow span of control?
- (a) subordinates may lack motivation
  - (b) costs related to administration tend to increase
  - (c) allows for tight control and supervision
  - (d) too much supervision may hinder motivation
8. Which one of the following is not a cardinal principle of sound organization?
- (a) flow of authority
  - (b) maximum number of subordinates
  - (c) attain balance
  - (d) specialization
9. Which one of the following is not a factor that determines the optimum number of subordinates?
- (a) efficiency of the superior
  - (b) nature of work
  - (c) duration of work
  - (d) responsibility
10. Which one of the following is not a factor that helps the organization to attain its balance?
- (a) span of control
  - (b) centralization of authority
  - (c) delegation of authority
  - (d) departmentation
11. The Line organization is favoured because of
- (a) more scope for favouritism
  - (b) no scope for specialization
  - (c) flexibility
  - (d) no scope for nepotism
12. Which one of the following is a demerit of the line organization?
- (a) simple to understand
  - (b) facilitates quick decisions
  - (c) each section is treated as a unit for control purposes
  - (d) instability is likely, due to a lack of continuity
13. Which one of the following is the demerit of line and staff organization?
- (a) relieves the line managers
  - (b) greater scope for advancement
  - (c) staff suggestions are seldom implemented
  - (d) enhances the quality of decisions
14. Which one of the following is a merit for the functional organization?
- (a) calls for more coordination
  - (b) disciplinary controls are well defined
  - (c) very costly
  - (d) no clear line of authority
15. Which one of the following is a demerit of the committee?
- (a) motivates all the concerned groups to participate
  - (b) yields good results

- (c) calls for high degree of coordination
  - (d) facilitates group decisions
16. Which one of the following refers to a project organization?
- (a) line organization
  - (b) military organization
  - (c) scalar organization
  - (d) matrix organization
17. Which one of the following is a merit for the matrix organization?
- (a) calls for greater degree of coordination
  - (b) difficult to define authority
  - (c) offers operations freedom
  - (d) difficult to define authority
18. Which of the following is a demerit in the matrix organization?
- (a) focuses on end results
  - (b) employees may find it frustrating to work with two bosses
  - (c) maintains professional identity
  - (d) seeks to optimize the utilization of resources
19. What is the process of classifying the organization on the basis of similar activities?
- (a) Formulation
  - (b) departmentation
  - (c) execution
  - (d) implementation
20. Which of the following is a merit for the functional organization?
- (a) calls for more coordination
  - (b) delayed decision making
  - (c) offers better control
  - (d) expensive in terms of time
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21. Which of the following is a demerit in the functional organization?
- (a) each function is focused
  - (b) reduces the load on senior executives
  - (c) specialization enhances the quality of decisions
  - (d) objectives are more focused than the corporate goals
22. Which of the following is a merit in the product organization?
- (a) central services maintenance may not be cost-effective
  - (b) tends to increase the control problems for top management
  - (c) organization may get disintegrated
  - (d) responsibility can be fixed for sales and profits for each product or service
23. Which of the following is a demerit for a product organization?
- (a) provides way for diversification
  - (b) ensures better customer care
  - (c) adequate number of professional managers may not be available
  - (d) all facilities are available under one roof
24. Which of the following is a demerit for the territorial organization?
- (a) responsibility is fixed at the territorial level
  - (b) may involve duplication of costs

- (c) managers at lower level can be made more responsible
  - (d) local resources can be utilized
25. Which of the following is a merit for the territorial organization?
- (a) local facilities can be under utilized
  - (b) difficult for the top management to monitor the territory level operations
  - (c) train managers for senior management positions
  - (d) difficult to find competent managers
26. Which of the following is a demerit for the customer organization?
- (a) ensures better customer care
  - (b) may be very costly
  - (c) develops a competitive advantage
  - (d) focuses on the specific needs of individual customers
27. Which of the following is a merit for the customer organization?
- (a) calls for focused training programs
  - (b) difficult to specialize in customer problems if the customer group is small
  - (c) it is based on the diversified needs of customers
  - (d) customer requirement keep changing
28. What is the limitation of the partial organization structure?
- (a) the superior subordinate relationship is illustrated
  - (b) managers tend to neglect to redraft charts as and when necessary
  - (c) describes how the activities of the entire organization are coordinated
  - (d) chart identifies lines of authority & responsibility
29. What refers to drawing the managerial attention only to exceptional problems?
- (a) manage via exception
  - (b) manage via perception
  - (c) manage via dictation
  - (d) manage via supervision
30. Which of the following refers to the policies & procedures of the organization?
- (a) manual
  - (b) book
  - (c) journal
  - (d) record
31. What refers to the effective control of a number of subordinates by a supervisor at a given point of time?
- (a) management
  - (b) control of power
  - (c) span of control
  - (d) authority
32. What refers to the line of flow of authority from the management to every subordinate in the organization?
- (a) unit of command
  - (b) flow of authority
  - (c) span of management
  - (d) delegation of authority

**1. which of the following refers to the process of managing the human resources of an organization in tune with the vision of the top management? [b]**

- a. CRM**
- b. HRM**
- c. HRD**
- d. PM & IR**

**2. what is a strategically driven process? [c]**

- a. HRD**
- b. PM & IR**
- c. HRM**
- d. CRM**

**3. which of the following is not a function of HRM? [b]**

- a. Focusing on term building**
- b. developing product sensitive management style**
- c. empowering employees**
- d. evaluating self appraisals**

**4. what refers to the process of managing people enabling them to contribute their best for the attainment of organization goals? [ c]**

- a. HRM**
- b. HRD**
- c. personnel management**
- d. industrial relations**

**5. what refers to the relations between the employees and the management? [c]**

- a. HRD**
- b. personnel management**
- c. industrial relations**
- d. HRM**

**6. who focused on compensation, integration and maintenance of people in the organisation? [b]**

**a. peter F drucker**

**b. Flippo**

**c. Pigours & myres**

**d. pyle**

**7.The process of formulating a personnel program, which is determined in advance is called [a]**

**a. planning**

**b. organisation**

**c. directing**

**d. controlling**

**8.The process of creating an environment integrating individual interests and organizational interests is known as [c]**

**a. development**

**b. compensation**

**c. integration**

**d. maintenance**

**9.which of the following is not a feature of personnel management? [b]**

**a. aims to achieve efficiency**

**b. aims to achieve proficiency**

**c. aims to achieve justice**

**d. concerned with people at work**

**10.who defined personnel mgt as a method of developing the employee potential? [c ]**

**a. clark**

**b. MB athreya**

**c. Pigours & myres**

**d. philip kotler**

**11.which of the following is not a feature of personnel management? [c]**

**a. is concerned with employees**

**b. is a method of helping employees**

**c. manages people at the lower level in the organisation only**

**d. is a method of channelising the potential**

**12.what is an expression of the values and beliefs of the organisation? [b]**

**a. induction**

**b. personnel policy**

**c. recruitment**

**d. service**

**13.what refers to the activities of a specialist responsible for devising and executing the personnel policies and strategies in the organisation? [b]**

**a. HRM**

**b.PM**

**c.IT**

**d.HRD**

**14.who referred to the goal of personnel mgt is employee orientation while the goal of HRM is organisation oriented? [a]**

**a. GA cole**

**b. pyle**

**c. flippo**

**d. Pigours & myres**

**15.which of the following is a benefit of HRM? [d]**

**a. decreases the employee productivity**

**b. decreases the employee commitment to the organisation**

**c. pre requisite for lower productivity**

**d. ensures that the right person is selected for the right job**

**16.which of the following is not a concern of HRM? [c]**

**a. minimizing conflicts**

**b. meeting technology changes**

**c. accommodate varying interests of a common workgroup**

**d. equipping the available staff in terms of skill set**

**17. what is the nature of relations between management and labour, as stated, or personnel & IR and HRM? [a]**

**a. pluralist, unitarist**

**b. unitarist, pluralist**

**c. personnel, human**

**d. human, personnel**

**18. what states how the employees should behave conduct themselves in the organisation? [c]**

**a. resources policy**

**b. finance policy**

**c. personnel policy**

**d. technology policy**

**19. what is not a function of a personnel manager? [b]**

**a. develop vision**

**b. develop objectives**

**c. develop cultures**

**d. advise line managers approximately**

**20. what is not a necessity of HRD? [b]**

**a. make organisational dynamics growth oriented**

**b. make industrial policies**

**c. succeed in a fast changing environment**

**d. make personnel policies**

**21. which of the following is a positive functions of HR.? [b]**

**a. selection**

**b. recruitment**

**c. training and development**

**d. performance appraisal**

**22. The function of introducing the company to the employee before he report for the duty is called [b]**



- a. training
- b. induction
- c. recruitment
- d. MBO

23. which of the following relates to "on-the-job training"? [a]

- a. demonstration
- b. conferences
- c. seminars
- d. case study

24. The stage at which the new recruit is allowed to exercise full authority and is held responsible for the results is called [c]

- a. induction
- b. selection
- c. placement
- d. recruitment

25. which of the following is a financial incentive? [a]

- a. stock options
- b. job security
- c. flexi-time
- d. job rotation

26. which of the following is a non-financial incentive? [c]

- a. stock options
- b. performance linked pay
- c. flexi-time
- d. groups bonus

27. which of the following is an example for the analytical methods of job evaluation? [a]

- a. ranking methods
- b. MBO
- c. factor comparison method
- d. point rating method

28. which of the following is an example for off-the-job training? [a]

- a. lecture method
- b. experiential learning
- c. demonstration
- d. apprentice training

29. In which of the following methods is the employee asked to choose to alternative? [b]

- a. ranking method
- b. forced distribution method
- c. narrative essay method
- d. MBO

30. In which of the countries given below has the Hay method been introduced? [b]

- a. india
- b. USA
- c. UK
- d. australia

31. which of the following denotes a number of techniques for planning and control of complex projects [a]

- a. network analysis
- b. planning analysis
- c. activity analysis
- d. project analysis

32. In network analysis the overall objective is [a]

- a. to minimise overall time spent
- b. to maximise overall return on capital
- c. to neutralise overall time spent
- d. to cover all activities at any cost

33. The minimum slack will always be [b]

- a. positive
- b. negative
- c. linear
- d. deterministic

34. PERT refers to [b]

**a. program escalation review tool**

**b. program escalation review technique**

**c. project evaluation revised testing**

**d. project evaluation reasoning tool**

**35.PERT & CPM provide [b]**

**a. logical picture layout & complex project sequence**

**b. identification the critical activities & events**

**c. an optimal rate of return on investment**

**d. basis for working time, cost & resources**

**36.which of the following is not a limitations of gantt's bar chart? [d]**

**a. interdependencies**

**b. project progress**

**c. uncertainties**

**d. coordination**

**37.which is the link between Gantt chart & PERT/CPM network? [a]**

**a. milestone chart**

**b. logical chart**

**c. network chart**

**d. activity chart**

**38.which of the following denotes a set of activities with specific goal for a specific period of time [b]**

**a. schedule**

**b. project**

**c. activity**

**d. critical path**

**39.what does CPM involve in a tradeoff between [c]**

**a. cost & quantity**

**b. time & work**

**c. cost & time**

**d. cost, time and quality**

**40.which of the following is event oriented? [a]**

**a. PERT**

**b. CPM**

**c. schedule**

**d. none**

**41.CPM is [c]**

**a. optimistic**

**b. probabilistic**

**c. deterministic**

**d. optimistic and probabilistic**

**42.In PERT activity is represented by [a]**

**a. arrow**

**b. circle**

**c. line**

**d. dotted circle**

**43. In PERT the event is represented by [b]**

**a. arrow**

**b. circle**

**c. line**

**d. dotted arrow**

**44.which of the following does task or job in a program is represent? [b]**

**a. event**

**b. activity**

**c. network**

**d. dotted event**

**45.what is the start or end of activity is called [a]**

**a. event**

**b. activity**

**c. critical path**

**d. event and activity**

**46.in PERT ,dummy activity represents [b]**

**a. dependence**

**b. logical dependence**

**c. logical independence among jobs**

**d. independence among jobs**

47. which of the following does not consume resource? [d]

- a. activity
- b. event
- c. dummy activity
- d. dangler

48. events left united to overall network are called [c]

- a. prototype
- b. sequence
- c. danglers
- d. drops

49. in optimistic time estimate, the time taken by activity is [b]

- a. maximum
- b. minimum
- c. no consumption of time
- d. none

50. path which contains all events with zero or minimum slack is [c]

- a. critical path
- b. succession or event
- c. critical slack
- d. event slack

51. Which form the costs directly proportional to number of activities in project? [c]

- a. Optimal costs
- b. Variable costs
- c. Direct costs
- d. Differential costs

52. What are the costs that are determined per day? [d]

- a. Direct costs
- b. Differential costs
- c. Direct costs
- d. Indirect costs

53. Which of the following costs varies with time? [c]

- a. Optimal costs

**b. Variable costs**

**c. Direct costs**

**d. Indirect costs**

**54. Interest on borrowings and advertisements form a part of [d]**

**a. Optimal costs**

**b. Differential costs**

**c. Direct costs**

**d. Indirect costs**

**55. Which of the following cost increases with number of days in the project [a]**

**a. Indirect costs**

**b. Differential costs**

**c. Direct costs**

**d. Optimal costs**

**56. What does Crash cost mean? [c]**

**a. cost incurred due to crash**

**b. cost incurred due to errors**

**c. cost incurred to reduce activity duration to minimum**

**d. none**

**57. What is the possible time to which the duration of the project could be reduced by pumping the additional resources? [c]**

**a. normal cost**

**b. normal time**

**c. crash time**

**d. none**

**58. What is the cost incurred if the project is allowed to take normal duration of time? [c]**

**a. optimum cost**

**b. excessive cost**

**c. normal cost**

**d. deterministic cost**

**59. What amount that is spent over and above normal direct cost for reducing the duration by one unit of time? [c]**

**a. optimum cost**

**b. excessive cost**

c. cost slope

d. deterministic cost

60. Which of the following cost increases with number of days in the project [c]

a. Indirect costs

b. Differential costs

c. Direct costs

d. Optimal costs

61. what refer to the process of planning undertaken by the top management to achieve their organizational goals [b]

a. strategy formulation

b. corporate planning

c. environmental scanning

d. corporate planning

62. which of the following is not a characteristic of a mission statement? [c]

a. flexible

b. provides shared visions

c. focuses on products

d. focus on limited

63. what refers to the broad guidelines set by the management for the purpose of making decisions at different levels in the organizations [b]

a. objectives

b. policies

c. goals

d. mission

64. which of the following is not a feature of policy? [c]

a. expresses organizational culture

b. provides discretion to managers

c. helps in coordinates decisions

d. brings out uniformity in action

65. what refers to the logical sequence of operations to be performed in a given or job? [b]

a. strategy

b. programs

c. purpose

d. policy

66. what refers to the process of identifying opportunities to develop or acquire businesses that are related to the company current business? [b]

a. intensive growth

b. integrative growth

c. diversification growth

d. concentric growth

67. what refers to the process where in a company legally takes over or acquires the business of any of its leading competitors? [c]

a. backward integration

b. forward integration

c. horizontal integration

d. concentric integration

68. what to the process where in a company could see new product that have technological and or marketing synergies with existing product lines to cater to a group of customers? [b]

a. conglomerate diversification strategy

b. concentric diversification strategy

c. horizontal diversification strategy

d. vertical diversification strategy

69. what reflects the vision of the top management? [c]

a. goal

b. policy

c. mission

d. strategy

70. what refers to the general of specific program of action and deployment of resources to all on goals in a set of given conditions? [a]

a. strategy

b. goal

c. programme

d. objectives

71. what involves an analysis and diagnosis of the external and internal environments of a business firm? [c]

a. environment analysis

b. SWOT analysis



**c. environment scanning**

**d. strategies analysis**

**72.what comprises the managerial decisions based on the perceived opportunities and threats of the firm? [b]**

**a. environment analysis**

**b. environment diagnosis**

**c. environment scanning**

**d. strategies analysis**

**73.what refers to the group of firms carrying on similar activity? [c]**

**a. suppliers**

**b. competitions**

**c. industry**

**d. strategy**

**74.what sector affects the flow and development of alternative raw materials, the life cycles of products and services? [d]**

**a. socio-economic sector**

**b. government sector**

**c. industry sector**

**d. technological sector**

**75.what risks arises from income inequalities, breakdown in law and order due to religious fanaticism unionization etc..? [b]**

**a. political risks**

**b. social risks**

**c. economical risks**

**d. financial risks**

**76.what refers to the process of analyzing and diagnosing the firms internal strength and weaknesses? [c]**

**a. internal analysis**

**b. strategic analysis**

**c. internal analysis and diagnosis**

**d. strategic analysis and design**

**77.which of the following is neither an internal strengths and weakness to a particular firm? [d]**

**a. managerial personnel**

**b. research and development**

**c. financial policies**

**d. organizational systems**

**78. what is the type of business where there is a large number of opportunities and threats of major magnitude?  
[b]**

**a. ideal business**

**b. speculative business**

**c. mature business**

**d. troubled business**

**79. which of the following is not an alternative strategy to deal with the factors in the external and the internal environment? [c]**

**a. TW strategy**

**b. ST strategy**

**c. SW strategy**

**d. OW strategy**

**80. what is the most preferred strategy where the firm can take advantage of the available opportunities through its present strengths? [b]**

**a. OW strategy**

**b. SO strategy**

**c. ST strategy**

**d. . TW strategy**

**81. which of the following is not a part of the environment? [b]**

**a. general**

**b. economy**

**c. industry**

**d. international**

**82. what is the tool for making a systematic evaluation of the enterprise's internal factors, which are significant for the company in its environment? [d]**

**a. internal analysis**

**b. external analysis**

**c. strategic analysis**

**d. strategic advantage profile**

**83. which of the following is always made at a given point of time? [b]**

**a. internal analysis**

**b. SWOT analysis**

**c. external analysis**

**d. environment analysis**

**84. From where do visionaries identify opportunities? [c]**

**a. strengths**

**b. weaknesses**

**c. threats**

**d. opportunities**

**85. Which of the following refers to the course of action desired to achieve the objectives of enterprise? [b]**

**a. schedule**

**b. strategy**

**c. scanning**

**d. evaluation**

**86. Which of the following is not a generic strategy alternative? [d]**

**a. stability strategy**

**b. expansion strategy**

**c. retrenchment strategy**

**d. allocation strategy**

**87. Which one of the following strategies implies that unviable products and services can be dropped. Name it [b]**

**a. expansion strategy**

**b. retrenchment strategy**

**c. stability strategy**

**d. combination strategy**

**88. What alliance refers to the process wherein two or more companies may get together to synergise their operations? [c]**

**a. promotional alliance**

**b. logistics alliance**

**c. product/services alliance**

**d. pricing collaboration**

**89. Which of the following is not an approach to internal expansion? [b]**

**a. penetrate existing markets**

**b. merges and acquisitions**

**c. add new products**

**d. add new markets**

90. Which of the following is not a possible strategy variation? [d]

- a. unrelated strategy
- b. passive strategy
- c. external
- d. diagonal

91. Which of the following is not one of the most generic types to initiate strategic thinking? [c]

- a. overall cost leadership
- b. differentiation
- c. diversification
- d. focus

92. At what stage can the success of a programmer be assessed? [b]

- a. implementation
- b. evaluation
- c. development
- d. design

93. Which of the following is not a stage in the process of strategy formulation and implementation? [c]

- a. corporate planning
- b. formulating policies
- c. generic alternatives
- d. plans and administrations

94. Which of the following refers to varying the strategy to address the specific requirements of the markets?  
[b]

- a. strategic alliances
- b. strategy variations
- c. promotional alliances
- d. logistic alliances

95. What refers to the decisions of the selection of strategy that will best meet the enterprise objectives? [c]

- a. strategic alliances
- b. strategy variations
- c. strategic choice
- d. pricing collaborations

96. Name the best strategy from the following for a firm whose divisions perform unevenly or do not have the same future potential? [b]

- a. expansion
- b. combination
- c. stability
- d. combination

97. A good strategy with effective implementation has..... Probability of success [b]

- a. lower
- b. higher
- c. moderate
- d. least

98. What strategy can be adopted in case of highly competitive and volatile markets? [d]

- a. stability strategy
- b. combination strategy
- c. retrenchment strategy
- d. expansion strategy

99. What strategy would be of better choice when the firm is doing well and the environment is relatively less volatile? [b]

- a. expansion strategy
- b. stability strategy
- c. combination strategy
- d. retrenchment strategy

100. Which of the following refers to the kind of alliances where in two or more companies come together to promote their products/services? [c]

- a. products/services alliances
- b. logistic alliances
- c. promotional alliances
- d. Pricing collaboration

101. just in time concepts eliminates [b]

- a. operations
- b. inventory
- c. man power
- d. WIP

102.JIT system is sometimes referred to as **adapting** [c]

- a. linear system
- b. lean production system
- c. TQM
- d. none

103.kanban is [a]

- a. information as to what has to be done
- b. over production
- c. inventory control
- d. automation

104.EOQ is [d]

- a. equal order quantity
- b. estimated overall quantity
- c. economic order quantity
- d. equilibrium open quantity

105.EOQ is the order quantity that [d]

- a. maximizes total annual carrying cost
- b. equates total cost
- c. multiplies total annual carrying cost
- d. minimizes total annual carrying cost

106.one of the following is a dynamic linked system .what is that? [a]

- a. JIT
- b. MRP
- c. EOQ
- d. TQM

107. Jikoda means [c]

- a. machines are maintained by workers
- b. machines monitoring taken care of by consultants
- c. providing machines with autonomous capability to use judgement
- d. minimization of work

108.TQM was first coined by [b]

- a. toyota

**b. US naval air systems command**

**c. general electric**

**d. mitsubishi**

**109. In six sigma context, which one of the following is valid? [c]**

**a. 3.4 defects per hundred units of production**

**b. 3.4 defects per trillion units of production**

**c. 3.4 defects per million units of production**

**d. 3.4 defects per one lakh units of production**

**110. six sigma methodology is accomplished through the use of [c]**

**a. DMAIC + DMADV**

**b. DMADV X DMAIC**

**c. DMAIC and DMADV**

**d. DMAIC - DMADV**

**111. which of the following companies is the pioneer of six sigma? [c]**

**a. general motors**

**b. general electric**

**c. motorola**

**d. wal mart**

**112. if a product or service does not confirm to the given specification, it is called to have [a]**

**a. defect**

**b. quality**

**c. design**

**d. defective**

**113. six sigma is registered trademark of [d]**

**a. GE**

**b. united bank of switzerland**

**c. honeywell international**

**d. yes bank**

**114. In six sigma methodology, DMAIC is to improve [b]**

**a. new business process**

**b. existing business process**

**c. future business processes**

**d. vendor development**

**115.DMADV is used for [a]**

**a. new process designs**

**b. existing process designs**

**c. vendor development**

**d. stock turnover**

**116.In the context of JIT ,muri means [c]**

**a. unevenness**

**b. waste**

**c. excess**

**d. creativity**

**117.In the context of JIT, muda means [b]**

**a. unevenness**

**b. waste**

**c. excess**

**d. creativity**

**118.which of the following refers to 'thinking creatively' in the JIT context? [d]**

**a. muri**

**b. muda**

**c. mura**

**d. soikufu**

**119.green belts refers to [a]**

**a. employees implementing six sigma**

**b. lenders following six sigma**

**c. competitors working under six sigma**

**d. government collecting taxes**

**120.shojinka means [a]**

**a. a flexible workforce**

**b. rigid work force**

**c. careful workforce**

**d. skillful workforce**



## 1) Define management ?

“Management is knowing exactly what you want men to do and then seeing that they do it the best and cheapest ways”.

F.W.Taylor “Management is defined as the creation and maintenance of an internal environment in an enterprise where individuals working together in groups, can perform efficiently and effectively towards the attainment of group goals”.

## 2) Define organization?

“Organization are collectivities of people that have been established for the pursuit of relatively specific objectives on a more or less continuous basis”.

William Scott “Organization is the form of every human association for the attainment of a common purpose”.

Mooney and Reilly “Organization involves the grouping of activities necessary to accomplish goals and plans assignment and these activities to appropriate departments and positions to appropriate departments and positions for authority delegation and coordination”.

## 3) What are the levels of management

1. Top Management
2. Upper Middle management
3. Middle Management
4. Lower Management
5. Operating Force or Rank and file workmen

## 4) What are the functions of management?

1. Planning
2. Organizing
3. Staffing
4. Directing
5. Controlling

## 5) Define Douglas McGregor Theory?

He divides leadership into two styles labeled theory “X” and theory “Y”. The traditional styles of leadership and controls stated in theory ‘X’ by McGregor, is exercised to managers on the basis of his assumptions about human beings.

## 6) Define Herzberg’s Two-factors Theory?

Maslow’s theory has been modified by Herzberg and he called in two-factors theory of motivation. According to him the first group of needs are such things as company

policy and administration, supervision, working conditions, interpersonal relations, salary, status, job security and personal life.

“Herzberg called these factors as ‘dissatisfiers’ and not motivators, by this he means their presence or existence does not motivate in the sense of yielding satisfaction, but their absence would result in dissatisfaction. These are also referred to as ‘hygiene’ factors.

## 7) Define Leader?

One who leads a given group or team of people is called leader. If you can influence people to perform better in a given organizational setting, that means you are a leader.

## 8) Write short notes on leadership styles?

Leader has to ensure that people under his guidance are comfortable and their good work is recognized.

A good leader has to adopt such a style of working that takes care of people around him. There are also some leader who do not care for people and who care more for the task completion.

## 9) What are the merits of line and staff organization?

Planned specialization: The line and staff structure is based upon the principle of specialization. The line managers are responsible for operations contributing directly to the achievement of organizational objectives where as staff people are there to provide expert advice on the matters of their concerns.

Quality decisions: Decisions come after careful consideration and thought each expert gives his advise in the area of his specialization which is reflected in the decisions.

Prospect for personal growth: Prospect for efficient personal to grow in the organization not only that, it also offers opportunity for concentrating in a particular area, there by increasing personal efficiency

Less wastage: There will be less wastage of material.

## 10)write short notes on Project Organisation?

A project organization is a special case where common service like finance, purchase etc. are organized at the functional level. But project resources are allocated to the project manager. Since the business responsibility rests with the project manager, necessary authority is given to him with the requisite resources. This type of organization structure helps in making decisions for project control in terms of cost, resource and time. In a project organization some of the functions are corporate responsibility and some of them are project manager’s responsibility.

## Essay questions:

### 1) Explain about functions of management?

Planning: Involves selecting the objectives and actions to achieves them planning stage involves decision making and choosing future courses of action from the various alternatives

**Organizing:** Role of each person in any organization is fixed. The concept of role is who will be doing what should be known, to achieve organizational targets efficiently. It is intended that all the tasks necessary to achieve targets are assigned to people who can do the best.

**Staffing:** Staffing function includes keeping the various organizational position fixed. This activity is done by identifying work force requirements, keeping the records of the performance of people working with the organization. So that suitable people can be prompted and at the same time people performing not up to the mark could be send for training. If all the above activities are taking place in nice way in any organization, it will give rise minimum work force turnover.

**Directing:** Directing means influencing people, so that they will contribute to the organization targets directing involves motivation, leadership styles and proper communication.

**Controlling:** It is the process of comparing the plans with the results. If there is deviation attain taken to be bridge the gap between plan and actual results. **Coordinating:** The essence of management is the achievement of coordination among people coordination is a complex process following the principles by which organization activity can be accomplished. Coordinative is possible only if all the personnel working in the organization accept the target of the organization. This target must be clearly defined and 'sold' to every one concerned.

2) Explain briefly about Taylor's Scientific Management Theory?

**Principles of Scientific Management:** Taylor through his principles of scientific management initiated a system in which there would be an effective and fruitful coordination and cooperation between the management and the workers.

**Development of Science for each element of work:** Analyze the work scientifically, rather than using thumb rule. It means that an attempt is made to find out what is to be done by a particular worker, how he is to do it, what equipment will be necessary to do it. This information is provided to the worker, so as to reduce wastage of tie, material etc. and improve the quality work

**Scientific selection, placement and training of workers:** This principle states that select the workers best suited to perform the specific task, and then train tem within the industry in order to attain the objectives of the enterprise workers should also be trained from time to time to keep them informed of latest development in the techniques of production.

**Division of Labour:** division of work in smaller tasks and separation of thinking element of job from doing element of the job, this is the principle of specialization. It is essential for efficiency in all sphere of activities as well as in supervision work

**Standardization of methods, procedures, tools and equipment:** Standardization helps in reducing time, labour and cost of production. The success of scientific management largely depends upon standardization of system, depends upon standardization of system, tools, equipments and techniques of production

**Use of time and motion study:** Taylor's introduced time and motion study to determine standard work. Taylor's undertook studies on fatigue, incurred by the workers and the time necessary

to complete task.

Differential wage system: Taylor's differential piece rate scheme provides an incentive for a worker to achieve high level of optimum output. It distinguishes the more productive workers from less productive workers and motivates them to produce more.

Cooperation between labour and management: Mutual respect and cooperation between the workers and management helps in providing proper and effective leadership. The labour starts thinking that it is their work and they must put their heart in the work assigned to him.

Principle of Management by Exception: Taylor suggested that only major or significant deviations between the actual performance and standard performance should be brought to the notice of top management. Top management should pay more attention to those areas of work where standards and procedures could not be established and where there is a significant variation between standard performance and actual performance.

### 3) Explain in detail Douglas McGregor's theories?

Douglas McGregor Theory: He divides leadership into two styles labeled theory "X" and theory "Y". The traditional styles of leadership and controls stated in theory 'X' by McGregor, is exercised to managers on the basis of his assumptions about human beings. These assumptions as laid down or observed by McGregor for theory 'X' are

#### Theory "X":

1. An average human being does not like to work and he tries to avoid it as far as possible.
2. He avoids accepting responsible and challenging tasks, has no ambition but wants security above all.
3. Because of this, the employees are to be forced, concerned and threatened with punishments to make them put their best efforts.

These people would not work sincerely and honestly under democratic conditions.

However the above assumptions are not based on research findings. The autocratic style basically presumes that workers are generally lazy, avoid work and shirk responsibilities. It is believed that workers are more interested in money and security based on these assumptions the leadership styles developed, insist on tighter control and supervision.

#### Theory of "Y":

It focuses a totally different set of assumptions about the employees

1. Some employees consider work as natural as play or rest.
2. These employees are capable of directing and controlling performance on their own
3. They are much committed to the objectives of the organization.
4. Higher rewards make these employees more committed to organization.
5. Given an opportunity they not only accept responsibility but also look for opportunities to out

perform others.

5. Most of them highly imaginative, creative and display ingenuity in handling organizational issues.

4) Describe leadership styles?

### Leadership and Leadership Styles:

Leader: One who leads a given group or team of people is called leader. If you can influence people to perform better in a given organizational setting, that means you are a leader.

Leadership is ability to influence people to achieve the given goals in an organization.

A true leader is one who shares success with followers and absorbs all failures.

A manager has to be a mini-leader (he has to inspire his subordinates and get work done) and leader to be a mega-leader (otherwise he does not understand the ground realities of functioning)

Leadership Styles: Leader has to ensure that people under his guidance are comfortable and their good work is recognized.

A good leader has to adopt such a style of working that takes care of people around him. There are also some leader who do not care for people and who care more for the task completion.

### Types:

Autocratic leadership: Here, leader command the followers and expects compliance from them for all the instructions given, leaders are more dogmatic and positive. They lead by his ability to withhold or give rewards or punishments. Here, no suggestions from the followers are entertained and almost top-down approach is seen. They direct others. They do not allow any participation.

Democratic leadership: Here leaders consult subordinates and involve them in decision making. They encourage discussion with the group leaders believes in two-way communication. They listen to followers; try to facilitate the decision making.

Free – Rein leadership: Free – Rein leaders exercises little authority and give maximum freedom to subordinates while making decisions. It is a bottom-up approach. Suggestions from the followers are encourage and rewarded. They give high degree of independence subordinates in their operations.

5) Write notes on Principles of Organization?

Principle of unity of objectives: An organization structure is effective if it enables individuals to contribute to entire objectives.

Principle of co-ordination: The aim of the objective can be achieved if proper co-ordination exists for different activities

Principles of organizational efficiency: An organization is efficient if it is structured to aid the accomplishment of enterprise objective with a minimum of unwanted consequences or costs.

Span of management principle: In each managerial position, there is a limit to the

number of persons an individual can effectively manage but the exact number will depend on the impact of underlying variables.

Scalar principle: The clearer the line of authority from the ultimate management position in an enterprise to every subordinate position, the clearer will be the responsibility for decision making the more effective will be organization communication.

Principle of delegation by results expected: Authority delegated to all individual managers should be adequate enough to ensure their ability to accomplish the results expected.

Principle of responsibility: The responsibility of subordinates to their superiors for performance is absolute, and superiors can not escape responsibility for the organization activity of their subordinates.

Principle of parity of authority and responsibility: The responsibility for actions can not be greater than that implied by the authority delegated, not should it be less.

Principle of unity command: The more complete an individual's reporting relationships to a single superior, the smaller the problem of conflicting instructions and the greater the feeling of personal responsibility for results.

Authority level principle: Maintenance of intended delegation requires that decisions within the authority of individual managers should be made by them and not be referred upward in the organization structure.

Principle of balance: The application of principles or technique must be balanced to ensure the overall effectiveness of the structure in meeting enterprise objectives.

Principle of flexibility: the more that provisions are made for building flexibility into an organization structure can fulfill its purpose.

Principle of leadership facilitation: The more an organization structure and its delegations of authority enable managers to design and maintain an environment for performance, the more they will help the leadership abilities of those managers.

# Strategic management and contemporary strategic issues

## SAQ TYPE:

Q1. Define mission?

A. The mission or purpose identifies the basic function or task of an enterprise or agency or of any part of it. Every kind of organized operation has, or at least should have if it is to be meaningful, purpose or mission.

Q2. Define policy and strategy?

- A. Policy a broad guideline set by the top management for the purpose of making decisions at different levels in the organization, once the corporate objectives are established policies can be formulated organization policy reflects the owner's attitude to different segments such a creditors the employees, customers and society at large.

**Strategies:** "Plan of Action"

- a) General programs of action and development of resources to attain comprehensive objectives
- b) The program of objectives of an organization and their changes, resources used to attain these objectives.

The determination of basic long-term objectives of an enterprise and adoption of courses of action and allocation of resources necessary to achieve the goals.

Q3.What is environment scanning?

- A. Environmental scanning is a vital part of the corporate planning process. Effective planners try to anticipate what is likely to happen or attempt to influence the environment in favourable directions. This requires long-term strategic vision and commitments to corporate planning.

Q4. Define swat analysis?

A.SWOT analysis is defined as the rational and overall evaluation of a company's strength, weakness, opportunities, and threats which are likely to affect the strategic choice significantly.

Q5. Define goal?

- A. It goals naturally contribute to the attainment of enterprises objectives but the two sets of goals may entirely different.

Q6. Define programmes?

- A. Programmes refer to the logical sequence of operations to be performed in a given project based on a set of goals, policies, procedures, rules and task assignments. They are used carry out a given course of action.

LAQs TYPE:

Q1. Explain in detail basic steps of strategic management process?

A. Strategic management is a process or series of steps. The basic steps of the strategic management process are

Identifying Corporate Mission: Identify what the organization wants to achieve to start with for the purpose of it is necessary that all concerned parties understand the overall purpose of the organization and the methods of attaining them. It is also desirable that they agree on the corporate policies of the organization.

Formulate strategic objectives: By preparing statements of mission, policy, strategy, and goals, the top management established the frame work within which its divisions or departments prepare their plans. It is essential that the members of the organization agree on these given strategic objectives. The strategic objectives thus formulated reinforce the commitment of the members of the organization to achieve the corporate goals.

Appraise internal and external environment: To evolve alternative strategies to achieve these goals, a detailed appraisal of both the internal and external environment is carried out. The appraisal of internal environment reveals the strengths and weakness of the firm. The appraisal of external environment reveals the opportunities and threats for the firm. It is popularly called as SWOT analysis capitalizes on internal strengths, make use of best opportunities and beware of the threats in the external environment.

Develop and evaluate alternative strategies: There could be some alternative strategies to pursue a given goals. If the goal is to expand the business, the following could be the three alternatives.

Sold new products to the existing product line

Finding new markets, a part from the present market territories.

Manufacturing within the organization, the components, which were earlier procured from outside.

similarly, if the goal is to attain stability, the alternative strategies could be to maintain the following.

The existing range of products The existing markets



The functions presently being carried out.

Select the best strategy: For the firm to be more successful, it is necessary to focus its strategies around its strengths and opportunities. It is a prerequisite that the members of the organization agree on the strategic plan. Such a plan, which has been generally agreed upon, is normally considered as the best strategy.

Establish strategic business units (SBUs): It is more strategic to define a business unit in terms of customer groups, needs and/or technology and set up the business unit accordingly. Most of companies define their businesses in terms of products.

Fix target allot resources to each SBU: The development of SBUs based on appropriate findings the top level management knows that its portfolio has certain old, established relatively new, and brand new products.

Resources should be allocated based on market growth rate and relative market share of SBUs. Here resources mean executive talent money and time. Developing operating plans: The operating plan explains how the long-term goals of the organization can be met, the corporate plans reveal how much the projected sales and revenue are where the top management finds a significance gap between the targeted sales and actual sales, it can either develop the existing business or acquire a new one to fill the gap.

Monitor performance: The results of the operating plans should be will monitored from time to time. In the case of poor performance, check up with the members of the team to find out their practical problems and sort these out. Also, it is essential to verify whether there are any gaps in formulating the operating/tactical plans.

Revise the operating plans, where necessary: It is necessary to revise the operational plans particularly when the firm does not perform as well as expected. The plans can be revised in terms of focus, resource or time frame.

Q3. Explain in detail steps involved in strategy formulation and implementation?

A. **Strategy Formulation**: This is often referred as strategic planning or long-range planning. This process is primarily analytical, not action-oriented. The strategy formulation process is concerned with developing a corporate mission, objectives, strategy and policy.

This process involves scanning external and internal environmental factors, analysis of the strategic factors and generation, evaluation, selection of the best alternative strategy appropriate to the analysis



Henry Mintzberg has pointed out that corporations objectives and strategies are strongly affected by top management's view of the world. This view determines the mode to be used in strategy formulation. These modes includes

Entrepreneurial mode: one powerful individual formulates Strategy.

The focus is on opportunities rather than on problems.

Strategy is guided by the founder's own vision of direction.

Adaptive Mode: This strategy formulation mode is characterized by reactive solutions to existing problems rather than a proactive search for new opportunities.

Planning Mode: Analysts assume main responsibility for strategy formulation.

Strategic planning includes both the practice search for new opportunities and the reactive solution of existing problems.

Thus, strategy formulation process involves environmental analysis organizational analysis, development of strategic alternatives and analysis and selecting the most appropriate strategy from the alternatives developed.

The corporate level strategies include:

- Stability strategies Growth strategies
- Retrenchment strategies
- Combination strategy or port-folio restructuring

### **Implementation of strategies:**

- Institutionalization of strategy
- Setting proper organizational climate Developing appropriate operating plans
- Developing appropriate organizational structures Periodic review of strategy

Q3. What are the strength and weakness of internal environment analysis?

A. **Internal environment analysis (Strength and Weakness)**: It is necessary to analyze one's own strength and weakness periodically to sustain the degree of its competitive strength. Generally top management or an outside consultant reviews competencies pertaining to marketing, financial, manufacturing and organizational system and rates each factor as a major strength, minor strength, major weakness, or minor weakness.

Strength: It is not necessary that a business organization has to correct all its weakness nor that it propagate its strength. The big question is whether the business should limit itself to those opportunities, where it possesses the required strength or should it consider better opportunities where it might have to develop certain strength.

Weakness: Some times the company may not do well not because its departments lack the required motivation but because they do not work together as a team for example consider the case of an electronics company which employs engineers, sales and service staff for its operations. It is not

adequate if they keep on doing their work. The organization becomes more effective only when they work as a team. It is therefore, critically important to build effective teams and assess the effectiveness of these teams. This is a part of the internal environmental audit. Progressive companies adopt this strategy.

<p><b>Strength:</b></p> <ol style="list-style-type: none"> <li>1) Value for money programme</li> <li>2) Pool of trained faculty</li> <li>3) Wide choice of offering</li> <li>4) National network of well equipped training centre</li> </ol>	<p><b>Weakness:</b></p> <ol style="list-style-type: none"> <li>1) Not aggressive in selling</li> <li>2) Course differentials not sharp</li> <li>3) Counselor enthusiasm in adequate</li> <li>4) Customers service not focused enough</li> </ol>
<p><b>Opportunities:</b></p> <ol style="list-style-type: none"> <li>1) Growing demand for computer education</li> <li>2) Computer library be coming a necessity</li> <li>3) Growth of rich training needs</li> <li>4) Need for customized training modules</li> </ol>	<p><b>Threats:</b></p> <ol style="list-style-type: none"> <li>1) Rise in number of competitions</li> <li>2) High rate of technological obsolescence</li> <li>3) Commoditization of training under cutting of fees.</li> </ol>

Q4. Explain in detail external environment analysis?

**A. External Environment Analysis (Opportunity and Threat):** The external environment has a profound impact on the business operations irrespective of the nature of the business. The business has to monitor the key forces both in to micro and macro environment. The forces in the micro-environment may be customer competitors, and other

The forces in the macro environment may be demographic, economic, technological socio-cultural, political or legal. All these factors and parties affect the business operations both in the short and long run. These factors can be grouped under three parts of the environment.

1. General environment
2. Industry environment
3. International environment

**General environment:** A firm is said to be more effective when its strategy caters to the needs effective when its strategy caters to the needs of the environment. The additional features added to the main product at times could provide a new life to the main product. The corporate units, which realize this, will survive in the long-run.

Thus, the major causes of growth, decline, and other large scale changes in firms are the factor in the external environment, not internal development.

Socio-economic sector The technological sector The government sector

Industry environment: It is an important component of the overall environmental analysis as input for corporate planning. Industry refers to the group of firms carrying on similar activity. It has three sectors, customers, suppliers and competitors.

Customers: The strategist must identify and analyze the customers for the organization locates the potential customers and the emerging changes in their buying pattern. It is necessary to identify the profile of buyers in terms of their needs and preferences based on the basic demographic factors such as age, income size of household and consumption pattern. These factors create the primary demand for products or service and help to scan the geographical environment for potential market and customers.

Suppliers: Strategist also must determine the availability and costs of supply condition including raw materials, energy, prevailing technology, money and labour. The supplier can influence a firm and its strategy, particularly when the firm is outsourcing its logistic requirements.

Competition: The strategist moulds his strategy in the light of the competitor's strategy, the exit or entry of competitors to be analyzed and diagnosed.

International Environment: The strategy of globalization implies a great source of opportunities and also threats to business firms. Such firms, which an make use of the opportunities, would flourish and those, which cannot gear up, would demise.

# Operations and marketing management

SAQ TYPE :

Q1. What is meant by plant layout?

A. Plant Layout is a technique of locating machines, processes and plant services within the factory in order to secure the greatest possible output of high quality at the lowest possible total cost of production.

Q2. Define in short job, batch and mass production?

A. Job Production is used when a product is produced with the labor of one or few workers and is scarcely used for bulk and large scale production.

Batch production is the method used to produce or process any product in groups or batches where the products in the batch go through the whole production process together.

Flow production (Process Production) is also a very common method of production. Flow production is when the product is built up through many segregated stages; the product is built upon at each stage and then passed directly to the next stage where it is built upon again. The production method is financially the most efficient and effective because there is less of a need for skilled workers.

Q3. Define work study?

A. Work study refers to the method study and work measurement, which are used to examine human work in all its contexts by systematically investigating into all factors affecting its efficiency and economy to bring forth the desired improvement.

Q4. Define work measurement?

A. Work measurement is the application of techniques designed to establish time for a qualified worker to carry out a specified job at a defined level of performance.

Q5. Define method study?

A. The systematic recording and critical examination of existing and proposed ways of doing work, as a means of developing and applying easier and more effective methods and reducing cost it is also called motion study.

Q6. Define statistical quality control?

A. It is defined as customer satisfaction in general and fitness for use in particular. Both the external consumer who buy the product and services and the internal consumers that is, all divisions or departments of the business organization are equally interested in the quality.

Q7. Define ABC analysis?

A. ABC analysis is a technique of controlling inventories based on their value and quantities. It is more remembered as an analysis for 'Always Better Control' of inventory.

Q8. Define EOQ?

A. Economic order quantity is defined that quantity of materials, which can be ordered at one time to minimize the cost of ordering and carrying the stocks. In other words, it refers to size of each order that keeps the total cost low.

Q9. Define sixsigma?

A. Six Sigma is a set of techniques and tools for process improvement. Six Sigma seeks to improve the quality of the output of a process by identifying and removing the causes of defects and minimizing variability in manufacturing and business processes.

## Q10. Define marketing?

- A. Marketing as a social process by which individuals and groups obtain what they need and want through creating, offering exchanging products and services of value with others.

### LAQ TYPE:

Q1.define plant layout ? explain in detail different types of plant layout?

A. Plant Layout: A technique of locating machines, processes and plant services within the factory in order to secure the greatest possible output of high quality at the lowest possible total cost of production.

Type of plant layout:

**Product or line layout:** This type of layout is developed for product-focused systems. In this type of layout only one product, or one type of product, is produced in a given area. In case of product being assembled, this type of layout is popularly known as an assembly line layout.

The work centers are organized in the sequence of appearance. The raw material centre at one end of the line and goes from one operation to another rapidly with minimum of work-in-process storage and material handling.

**Process or Functional layout:** This type of layout is developed for process focused systems. The processing units are organized by functions into departments on the assumption that certain skills and facilities are available in each department similar equipments and operations are grouped together, e.g., milling, foundry, drilling, plating, heat treatment etc.

The use of process-focused systems is very wide in both manufacture and other service facilities such as hospitals, large offices, municipal services, etc

**Job Shop Layout :** It is a layout for a very general flexible system that is processing job production, The preparation of such a layout is dependent on the analysis of the possible populations of orders and is a relatively, complex affair. **Project or Fixed position Layout:** This is the layout for project type systems in which the major component is kept at a fixed position and all other materials, components, tools machines, work etc. are brought and assembly or fabrication is carried out. This type of layout is now not used very commonly as the machines required for manufacturing work are big and complicated. The fixed position layout is used only when it is difficult to move the major component and fabrication is to be carried out. Ex: production of ships.

Q2. what is productivity ?explain different types of production?

a.Productivity:

**Definition:** Productivity is defined as the rate at which the goods and services are produced.

It refers to the relationship between the inputs and the output. It is calculated as a ratio between the amount produced and the amount of resources (land, labour, capital, technology etc.) used in the course of production in other words

Productivity=  $\frac{\text{Output}}{\text{Input}}$

And also defined productivity as human efforts to produce more and more with less and less inputs of resources as a result of which the benefits of production are distributed among maximum number of people.

#### Method of Production:

**Job production:** In this system, goods are produced according to the orders with this method, individual requirements of the consumers can be met. Each job order stands alone and is not likely to be repeated. This type of production has a lot of flexibility of operation and hence general purpose machines are required. Factories adopting this type of production, are generally small in size. Advantages:

1. It is the only method, which can meet the individual requirement.
2. There is no managerial problem, because of very less number of workers, and small size of concern.
3. Such type of production requires less money and is easy to start. Disadvantages:

1. There is no scope for continuous production and demand
2. As the purchase of raw materials is less, hence cost of raw materials per unit will be slightly more.
3. For handling different type of jobs, only skilled and intelligent workers are needed, thus labour cost increases.

**Batch production:** This type of production is generally adopted in medium size enterprise. Batch production is in between job production and mass production. Batch production is bigger in scale than the job production. While it is smaller than that of mass production, batch production requires more machines than job production and fewer machines than that of mass production.

Advantages:

1. While comparing with mass production it requires less capital
2. Comparing with job production, it is more advantageous commercially.
3. If demand for one product decrease then production, for another product may be increased, thus the risk of loss is very less.

Disadvantages:

1. Comparing with mass production cost of scales and advertisement per unit is more

2. Raw materials to be purchased are in less quantity than that in mass production; therefore it is slightly costlier than that of mass production because less quantity discount is available.

**Mass production:** This method of production is used by concerns where manufacturing is carried on continuously in anticipation of demand though demand of the product may not be uniform through the year.



In mass production, simplification and standardization of products are made with the help of specialized (one purpose) machine, articles of standardized nature can easily and economically be produced on a large scale.

There is a small difference between mass production and continuous production. This is mainly in the kind of product and its relation to the plant. In mass production plant and equipment are flexible enough to deal with other products, involving same production process. Whereas in continuous or process production only standardized product in a sequence produced. In this method layout and requirement of additional tools and equipment

Advantages:

1. A smooth flow of materials from one work station to the next in logical order.
2. Since the work from one process is fed directly into the next, small in process inventories result
3. Total production time per unit short
4. Simple production planning control system are possible
5. Little skill is usually required by operations at the production line, hence training is simple, short and inexpensive.

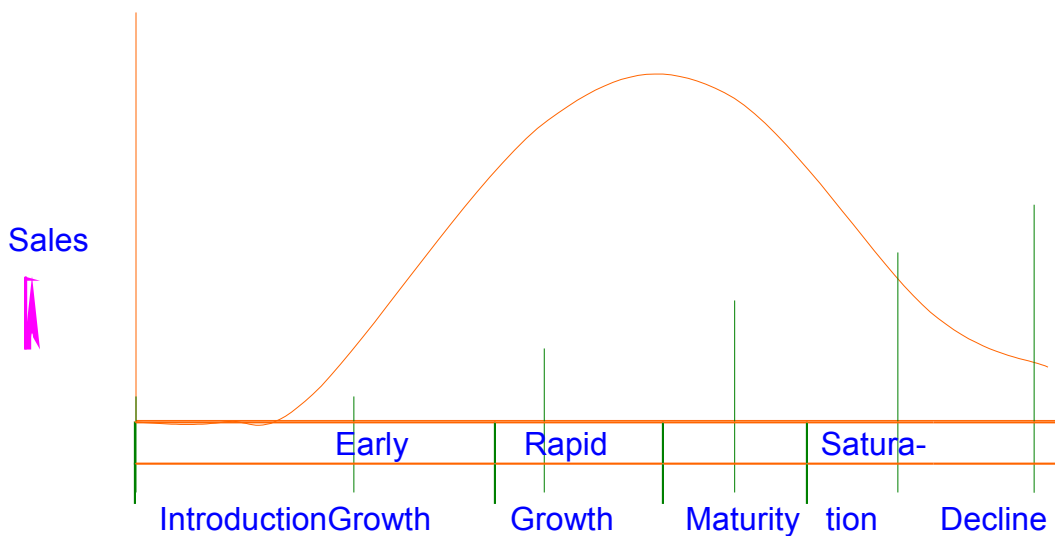
Disadvantages:

1. A breakdown of one machine may lead to a complete stoppage of the line that follows the machine. Hence maintenance and repair is challenging job.
2. Since the product dictates the layout, changes in product design may require major changes in the layout.
3. Generally high investment are required owing to the specialized nature of the machines and their possible duplication in the line

Q3. Explain marketing strategies based on production life cycle?

A.Product life cycle:

1. Products have limited life.
2. Products sales pass through distinct stages, each passing different challenges, opportunities and problems to seller.
3. Profits rise and fall at different stages of product life cycle



**Early growth:** when the results of usage of product start flowing into the market and the results are encouraging, more and more buyers come forward to try. The sales revenue remains very low till this point of time. This is also a very critical stage, as the manufacturer cannot avail scale economies

**Rapid growth:** A new product enters the stage of rapid growth when it satisfies the needs of the customers. The sales start picking up with repeat purchases and by word of mouth publicity, coupled with continued promotion outlay from the manufacturer's side. As new customers get attracted to the product for the first time, sales soar, sales revenues increase faster than costs, and profits start accruing. This trend attracts the attention of the competitors who release a similar product copying the best features of the new product.

**Maturity:** When the product's sales growth slows down, it is called maturity. Due to this slowdown, the industry as a whole suffers from overcapacity. At this stage, firms tend to attract the customers away from their competitors through cheaper prices and larger promotional efforts and outlay. Those who cannot afford such large promotional outlay and woo customers of the competitors.

**Saturation:** When the sales growth slows down to zero, such a stage is called saturation. This size of the market does not increase beyond this stage. In other words, old customers who have stopped buying the product replace any new customer entering the market. All sales are simply replacement sales or repeat purchases by the same customers.

**Decline:** When sales of a product tend to fall, such a stage is called decline. When a product ceases to satisfy the customer's needs in relation to those available in the market, it is no more preferred. As a result, its competing products offering superior benefits take over the market. This leads to weakened profitability.

Q4. explain channels of distribution in detail?

A. Type of Channels of Distribution: Channels of distribution refer to the ways and means of reaching the customer through the intermediaries such as wholesalers, retailers, and other agencies, if any.

Manufacturer – consumer: This is a direct marketing channel where the manufacturer contacts the customer directly without involving middlemen or intermediaries. The manufacturers of industrial goods such as aeroplanes, turbo-engines, ships, and other high-value capital goods mostly follow this route.

However, consumer product manufacturers also through Internet, mail order operations, and door-to-door selling are following this method. It is common sight to find the representatives of the manufacturers going from house to house to sell their products, which are normally used in the households. Manufacturer – wholesaler – consumer: This channel is primarily used in the case of industrial goods and high-value consumer durable products. The wholesaler, who may also be called as distributor in this channel, carries out the functions of retailing to large customers who may in themselves be the manufacturers also. The wholesalers in this channel buy goods from many manufacturers, stock, and subsequently, sell them through internet or directly to the

customers in a wider geographical area. An example of the use of this method can be observed in the computer hardware industry.

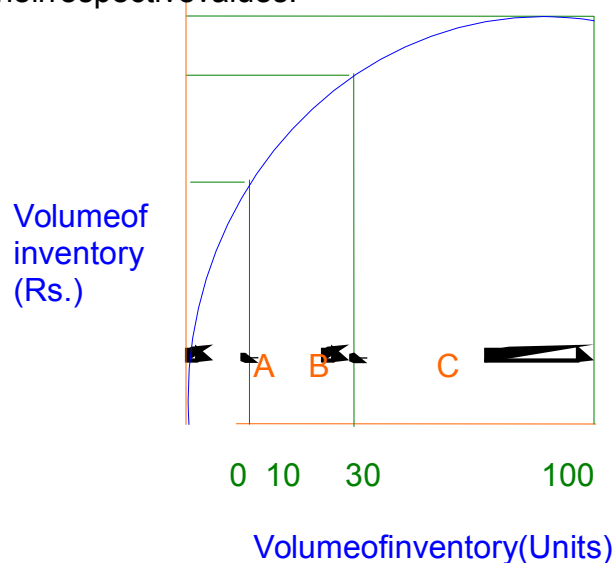
**Manufacturer – retailer – consumer:** Here, the large retailing chains, including supermarkets, use this channel to buy products in large quantities from manufacturers at a very competitive price and sell the same to the ultimate consumers. As the retailers enjoy large discounts in this process, they share this benefit with their customers by keeping their products competitively priced. The consumers patronage this channel because they can buy in small quantities from a wide variety at lower prices.

**Manufacturer – wholesaler – retailer – consumer:** This is a chain widely followed for fast moving consumer goods, which are likely to have mass markets. When the consumers are large in number, widely dispersed geographically, and products are of low value, this channel is favoured. Manufacturers would find it prohibitively expensive to set up their own outlets in such circumstances. For manufacturers of consumer goods such as hosiery, food items, confectionery, clothes, and readymade garments, cosmetics, and so on, intermediaries are indispensable in the distribution chain.

Q5. explain in detail Abc analysis and eoq in detail?

A. **ABC Analysis:** ABC analysis is a technique of controlling inventories based on their value and quantities. It is more remembered as an analysis for

‘Always Better Control’ of inventory. Here all items of the inventory are listed in the order of descending values, showing quantity held and their corresponding value. Then, the inventory is divided into three categories A, B and C based on their respective values.



A – Refer to high value item

B – Refer to medium value item

C – Refer to low value item

**A** category comprises of inventory, which is very costly and valuable. Normally 70% of the funds are tied up in such costly stocks, which would be around 10% of the total volume of stocks. Because the stocks in this category are very costly, these require strict monitoring on a day-to-day basis.

**B** category comprises of inventory, which is less costly. Twenty percent of the funds are tied up in such stocks and these accounts for over 20% of the volume of stocks. These items require monitoring on a weekly or fortnightly basis.

**C** category consists of such stocks, which are of least cost. Volume-wise, they form 70% of the total stocks but value-wise, they do not cost more than 10% of the investment in the stocks. This category of stocks can be monitored on a monthly or bi-monthly basis.

The following table summarizes the concept of ABC analysis;

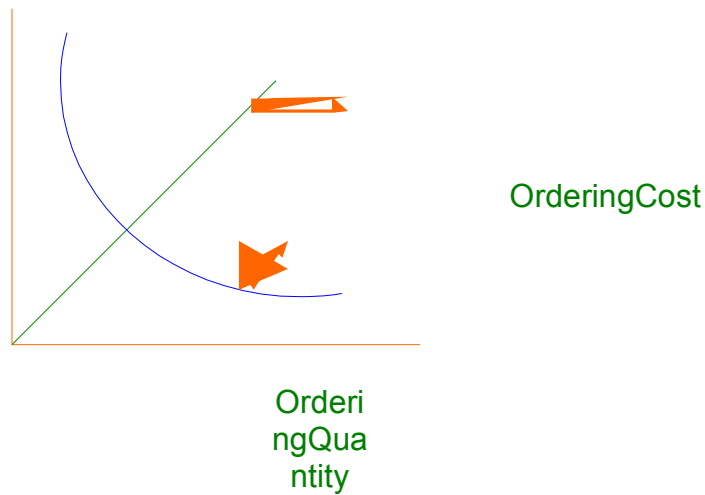
Category	Value(%)	Volume(%)	Desired Degree of Control
A	70	10	STRICT
B	20	20	MODERATE
C	10	70	LOW

**Economic Order Quantity (EOQ):** Economic order quantity is defined as that quantity of materials, which can be ordered at one time to minimize the cost of ordering and carrying the stocks. In other words, it refers to the size of each order that keeps the total cost low.

**Inventory costs:** The inventory costs can be classified into two categories, 1) Inventory ordering cost 2) Inventory carrying cost.

Annual Cost

Carrying Cost



## HUMAN RESOURCE MANAGEMENT

### SHORT QUESTIONS WITH ANSWERS

1Q. What is personal management and HRM?

**A. Personnel Management:** Defines personnel management as the planning, organizing, and controlling of the procurement, development, compensation, integration and maintenance of people for the purpose of contributing to the organizational goals.

**Human Resource Management:** Human resource management is the process of managing the human resources of an organization in tune with the vision of the top management.

2Q. Compare personal management and HRM?

#### **Personal management versus Human resource management:**

A. Personnel management function is often viewed as a function of the specialized staff.

Human resource management function is the responsibility of all the line managers in the organization.

- Personnel management goal is employee orientation  
Human resource management goal is organization orientation
- Personnel management managerial function Human resource management operative function
- Personnel management cooperative level manager concern Human resource management top level manager concern.

3Q. What is man power planning?

A. **Manpower Planning:** It is the scientific process of evolving the right quantity of right men to be required in future at right time on the right job.

**Definition:** Manpower planning may be defined as a rational method of assessing the

requirements of human resources at different levels in the organization. It ends with proposals for recruitment, retention, or even dismissal, where necessary.

4Q. Define job analysis and job description?

- A. **Job Analysis:** Job analysis can be defined as the process of identifying the tasks comprising a particular job to assess whether they could be organized in a productive manner. This will identify the main features of the job, the major tasks undertaken, the results to be achieved, and how one job is related to the other jobs in the organizational hierarchy. The product of job analysis is job description.

### Job Specification

Job specification identifies the requirements on the part of the person to perform the given job. It provides the interviewer an understanding of the job and helps him to assess the qualities necessary for its performance to an acceptable standard, at the time of interview. This helps him to compare the performance of candidates objectively and to eliminate unsuitable candidates.

5Q. Define training and development?

- A. **Training:** Training is short-term process of utilizing systematic and organized procedure by which the staff acquires specific technical knowledge and functional skills for a definite purpose. The focus of training is the job or task.
- B. **Development:** Development is an activity aimed at career growth rather than immediate performance. Employee development is the process, which helps him or her to understand and interpret knowledge rather than teaching a specific set of functional skills. Development, therefore, focuses more on employee's personal growth in the near future.

6Q. What are methods of job evaluation?

**A. Method of Job Evaluation:** It is broadly be classified as

- 1) Qualitative Method
- 2) Quantitative Method

**Qualitative Method:** It can broadly be classified as ranking or classifying the job from lowest highest.

**Quantitative Method:** Where point values are assigned to the various demands of a job and relative value is obtained by summing all such point values.

7Q. What are the steps involved in performance praise?

A.

- **Steps in performance Appraisal:**
- Create set up performance standards
- Mutually set identifiable and measurable
- Measure present level of performance
- Compare and appraise present level of performance with standard

- Identify and initial.

8Q. What are advantages and disadvantages of job evaluation?

A. **Advantages:**

1. It is simple, inexpensive and expeditious
2. It is easily understood and easily administered
3. It helps setting better rates than the arbitrary rates based purely on judgment and experience
4. Same unions prefer it, because it leaves more room for bargaining.

**Disadvantages:**

1. Job may be ranked on the basis of incomplete information and without the benefits of well defined standards
2. The rank position of different jobs is likely to be influenced by the prevailing wage rates
3. No one committee member is likely to be familiar with all jobs .

9Q. What are functions of personnel management?

A. **Functions of Personnel Management:**

**Managerial Function**

Planning  
 Organizing  
 Staffing  
 Motivating  
 Controlling  
 Record keeping  
 Personnel planning and evaluation  
 Personnel research and audit

**Operative Functions**

Procurement of personnel  
 Development of personnel  
 Compensation of personnel  
 Employees benefits schemes  
 Maintaining good industrial relations

10Q. Define motivating and controlling?

- A. **Motivating:** Motivating comprises these are the functions payment recreation, communication, health and safety.
- B. **Controlling:** Controlling comprises these are the functions performances appraisal, security, employees' attitude and coordination.

**LONG QUESTIONS WITH ANSWERS**

1Q. What is personnel management and industrial relation? explain its characteristics?

**Personnel Management and Industrial Relations:**



The word personnel management is popular with different names, such as staff management, labour management, manpower management, industrial relations and modern times as human resources management. Industrial relations refer to the relation between the employees and management.

**Characteristics of personnel management:**

**Maximum individual development:** This principle stresses on the development of every person working in an organization. Workers are able to fulfill the objectives of an organization with the minimum cost. Hence, the employees in the organization should be properly developed. By this, employees will be able to develop themselves to the maximum extent of their capabilities. Their ability, productivity and efficiency can be used for achieving the objectives of the organization.

**Scientific selection:** For the proper co-ordination between work and workers, it is necessary to select the right person for the right job. Workers should be selected after a careful weighing of the requirements of the jobs on the other hand, and assessment and evaluation of the abilities and attitudes of man on the other.

**High morale:** It is necessary to have high morale among the workers in an organization. For this purpose, ideal wage policy should be offered in the organization. Workers should be motivated by monetary and non-monetary incentives.

**Dignity of labour:** Human resource management specially act, so that the workers feel proud of their work or labour. Sometimes, like 'work is worship' notion should be developed in workers. This principle requires treating every job and every jobholder with dignity and respect.

**Team spirit:** Team spirit must be developed in the workers. They should work collectively and they should feel collective responsibility for the attainment of the objectives of the organization. For this purpose, workers must have the sense of cooperation, unity and mutual trust.

**Effective communication:** There must be effective channel of communication between the management and the workers. The orders of higher authorities should reach the workers, while worker's request and grievances should reach the higher authorities in a proper way. If communication system is not effective, then there will arise complex problem like mistrust, hatred and ill-will, and this in turn affects the production of the organization.

**Fair remuneration:** Labour should be given fair and proper compensation for the work they rendered. They should also be given fair incentives or rewards to

recognize good performance. This develops industrial peace.

Effective utilization of human resources: The skills and abilities of human resources should be effectively utilized. Proper training facilities should be provided to workers. Human resource management is an art to get the work done by the people, to get the desired result. For this employees should be given humanly treatment in the organization.

Participation: This principle emphasizes the idea of labour participation in the management of the enterprise. Workers participation in management aims at increasing productivity of labour

Contribution to national prosperity: This principle stresses to provide a higher purpose of work to all employees and to contribute to national prosperity. For this purpose, human resource management should develop the sense of participation in labour to make them realize that their efforts alone can contribute to the prosperity of the organization and of the country

## 2Q. What is training and explain methods of training?

A. **Training**: Training is short-term process of utilizing systematic and organized procedure by which the staff acquires specific technical knowledge and functional skills for a definite purpose. The focus of training is the job or task.

**Methods of Training**: There are two methods of training

- 1 On-the job training
- 2 Off-the job training

**A) On-the job training**: It is designed to make the employees immediately productive. It is learning by physically doing the work. The focus here is to provide specific skills in a real situation. These methods include:

1) Job instruction training: This is a method used for such jobs which can be performed with relatively low skill. Here, the trainees systematically acquire skills by following routine instructions in key processes from a qualified instructor.

2) Experiential learning: This is a modern approach to the learning process. This method is more . used for training the senior executives. It is a technique, which empowers the manager-trainee with the freedom of choice to act upon and the capacity to initiate, rather than simply respond, to circumstances.

3) Demonstration: Here, the work procedures are demonstrated to the trainees. Each of the trainees is asked to carry out the work, on a sample basis, based on his/her observation and understanding of the demonstration.

4) Apprentice training: Those who are selected to work in the shop floor are trained as apprentices in the factory for a brief period ranging from three months to one year, depending upon the complexity of the training. Those who show good progress in this training are likely to be absorbed in the same organization. Those who complete apprentice training are likely to get good jobs outside also.

**B) Off-the-job training methods:** provide a relatively broad idea relating to a given job or task. These are meant for developing an understanding of general principles, providing background knowledge, or generating an awareness of comparative ideas and practice. These methods include:

1) Lectures/talks and class room instructions: These techniques are designed to communicate specific interpersonal, technical, or problem-solving skills. Here, the trainer can maintain a tight control over learning. However, this method restricts the trainee's freedom to develop his/her own approaches to learning.

2) Conferences: Conferences refer to get-together of the experts from different areas of a given topic. These experts present their views based on their work experience and research results. When employees participate in such events they get a feel of the real world. They may also get motivated to perform better.

3) Seminars: Seminars are held periodically by the professional organisations for the benefit of all the practicing managers by taking into consideration the recent advances in a specialized area. Participation in such seminars enables the executives to get exposed to the recent developments in the area of their interest.

4) Team discussions: This technique develops team spirit among the executives from different departments. It also enables them to understand and appreciate each other's problems. It reinforces a feeling of unity among those who work towards common goals.

Case study: This is a predominant technique followed even in premier management institutes. This technique helps to provide an understanding of what has gone wrong in a particular case, such as Delhi Cloth Mills (DCM). Similarly, what are the factors responsible for the success of organizations such as Reliance or Hindustan Lever. Case study technique is a very good method of learning the principles and concepts. However, this method has one weakness. The circumstances you are likely to face in your life may be very different from the cases you have analyzed earlier! Case studies help to enhance the analytical & decision making skills.

Q3.explain in detail job description?

A. **Job Evaluation**: An attempt to determine and compare the demands which the normal performance of particular job makes on normal workers without taking account of the individual abilities or performance of workers concerned. It rates the job not the rank.

**Objectives:**

1. To establish correct wage differentials for all jobs within the factory
2. To bring new jobs into their proper relative with jobs previously established
3. To help clarify lines of authority, responsibility and promotion
4. To accomplish the foregoing by means of the facts and principles, which can be readily explained to and accepted by all concerned
5. To establish a general wage level for a given factory which will have parity with those of neighboring factories

**Advantages:**

5. It is simple, inexpensive and expeditious
6. It is easily understood and easily administered
7. It helps setting better rates than the arbitrary rates based purely on judgment and experience
8. Some unions prefer it, because it leaves more room for bargaining.

**Disadvantages:**

4. Job may be ranked on the basis of incomplete information and without the benefits of well defined standards
5. The rank position of different jobs is likely to be influenced by the prevailing wage ranks
6. No one committee member is likely to be familiar with all the jobs

**Method of Job Evaluation**: It is broadly classified as

- 3) Qualitative Method
- 4) Quantitative Method

**1) Qualitative Method:** It can broadly be classified as ranking or classifying the job from lowest highest.

**a) Ranking technique:** In this method, the jobs in the organization are arranged in either in the ascending or descending order and numbered serially. The basis of such arrangement could be the job description in terms of duties, responsibilities, qualifications needed, relative difficulty involved in don the job, or value to the company.

**Points considered:**

1. Amount of work involved
2. Supervision needed
3. Extent of responsibility required
4. Difficulties involved in the work
5. Work conditions required

**b) Classification Method:** This is also called job-grading method. Here, the number of grades and the salary particulars for each grade are worked out first. The grades are clearly described in terms of knowledge, skill and so on. **Major steps for job evaluation:**

1. Deciding the number of grades
2. Writing grade descriptions
3. Identifying/listing of the jobs to be evaluated
4. Preparing job descriptions

**2) Quantitative Method:** Where point values are assigned to the various demands of a job and relative value is obtained by summing all such point values.

**a) Factor comparison method:** Every job requires certain capabilities on the part of the person who does the job. These capabilities are considered as critical factors, which can be grouped as follows:

Q4. explain in detail methods of merit rating?

A.

**Method of Merit Rating:**

**Ranking method:** In this method, all the staff of a particular cadre or a department are arranged either in the ascending or the descending order in order of merit or value to the firm. Though this is a simple method, it cannot be followed where the employees in the department are many in number.

**Paired comparison method:** Here, every employee is compared with all others in a particular cadre in the department. By comparing each pair of employees, the rater can decide which of the employees is more valuable to the organization.

**Rating scale:** Here, the factors dealing with the quantity and quality of work are listed and rated. A numeric value may be assigned to each factor and the factors could be weighed in the order of their relative importance. All the variables are measured against a three or five point scale.

**Forced distribution method:** Here, employees are given a set of alternatives and they have to choose one, which reflects their understanding of the true nature of the job. Their thinking is conditioned by the given set of answers.

**Narrative or essay method:** Here, the candidate is required to narrate in an essay format his/her strengths, weaknesses, and potential to perform. Here, the candidate is not restricted by any given set of alternatives. The candidate is free to decide what to furnish or what not to furnish.

**Management by objectives (MPO):** The short-term objectives mutually agreed upon by the management and the employees are used as performance standards. This method considers the actual performance as the basis for evaluation. It is a systematic method of goal setting. In addition, it provides for reviewing performance based on results rather

than personality traits or characteristics. However, this is not practical at all levels and for all kinds of work in the organizations.

Q5.explain in detail the functions of management?

A. Personnel research and audit

**Managerial Function:**

**Planning:** It is concerned with manpower planning

- 1) To forecast future vacancies
- 2) To anticipate retirements promotions and transfer
- 3) Preparing job analysis, job description and job specifications
- 4) Analyzing resources of potential employees

**Organizing:** It is concerned with organizing manpower

1. To analysis organization structure
2. Recommending organizational changes
3. To analyze applications and determine suitability of candidates
4. Interviewing conducting test
5. Investigating references
6. Arranging medical examination

**Staffing:** Staffing comprises these are functions induction, transfer/promotion, Manpower development and training.

**Induction:** To ensure new recruits are provided with appropriate training,

- a) Orienting new employees into their jobs
- b) Reviewing their performances
- c) Ascertaining training requirements

**Transfer/Promotion:** To utilize employees enhanced capabilities

4. Continuously analyzing job description
5. Evaluating employee qualification/performance
6. Determining further training requirement

**Manpower development:** To provide individual employees development

2. Developing performance standards
3. Appraising performance
4. Planning individual

development program **Training:** It includes the followings

1. Conducting training program
2. Evaluating training results

**Motivating:** Motivating comprises these are the functions payment recreation, communication, health and safety.

**Payment:** To set pay scales for different job positions and considering pay scales in other organization

1. Analyzing jobs as per job description
2. Evaluating such jobs
3. Develop scales

**Recreation:** To provide facilities for enjoyment

- a) Conducting social activities
- b) Sports and games
- c) Recreational activities

**Communication:** To provide needed exchange of information throughout the organization.

- a) Developing channels and media of information system
- b) Introducing suggestion scheme
- c) Conducting opinion surveys

**Health and safety:** Prevent diseases and provide security measures

- a) Providing medical facilities
- b) Providing safety measures

**Controlling:** Controlling comprises these are the functions performances appraisal, security, employees' attitude and coordination.



Performance appraisal: To appraise performance as per their duties and responsibilities

- a) Developing performance evaluating system
- b) Conducting performance evaluating interviews
- c) Analyzing evaluation results

Security: To provide precautionary measure to prevent theft, fire etc.

1. To develop and implement security measures
2. To provide watchman
3. To organize fire fighting training

Employee attitude and coordination: To improve employees attitude and coordination of work.

1. Analyzing personal problems arrange consulting
2. Implement improved practices

## PROJET MANAGEMENT (PERT/CPM)

### Saq type:

#### **Q1.what is network analysis?**

- A. It is refers to a number of techniques for the planning and control of complex projects. The basis of network planning is the representation of sequential relationships between activities by means of a network of lines and circles. The idea is to link the various activities in such a way that the overall time spent on the project is kept to a minimum.

#### **Q2.what is Ghat's bar chart?**

- A. Gantt charts and mile stone charts were used tools to monitor the project progress in complex projects. Gantt chart is a bar chart, which was developed by Henary Gantt around 1900.

It is consists of two coordinate axes, one represents the time and

the other jobs or activities performed.

Q3. what is mile stone chart?

- A. Milestone chart is an improvement over Gantt chart. It has become a good line between Gantt chart and PERT and CPM network. Every task represented by a bar in Gantt's bar chart, is subdivided in terms event or point in time.

**Q4. what is PERT?**

- A. Programme evaluation and review technique (PERT) is a tool to evaluate a given programme and review the progress made in it from time to time. A programme is also called a project. A project is defined as a set of activities with a specific goal occupying a specific period. It may be a small or big project, such as construction of a college building, roads, marriage, picnics etc.

Q4. what is CPM?

A. Critical path method assumes that the time required to complete an activity can be predicted fairly accurately, and thus, the costs involved can be quantified once the critical path has been identified. Since time is an important factor, CPM involves a trade-off between costs and time. It involves determining an optimum duration for the project, that is, a minimum duration that involves the lowest overall costs.

Q5. what is total float?

A. 1) Total float: It is the additional time which a non critical activity can consume without increasing the project duration. However total float may affect the floats in previous and subsequent activities.

$$\text{Total float} = \text{LST} - \text{EST} \quad \text{or} \quad \text{LFT} - \text{EFT}$$

Q6. what is free float?

A. Free float: Free float refers to the time by which an activity can expand without affecting succeeding activities.

Free float = EST of Head Event – EST of Trail Event – Activity duration

Q6. what is independent float?

A. Independent float = EST of Head event – LFT of Trail event – Activity duration

Q7. what is float ? mention different types of float?

A. Floats in the network analysis represent the difference between the maximum time available to finish the activity and the time required to complete it.

Floats are three types:

1) Total float 2) Free float 3) Independent float

Q7. what is critical activity?

A. In a network diagram critical activities are those which if consume more than their estimated time, the project will be delayed. It shown with thick arrow.

Q8. what is slack?

A. Slack means the time taken to delay a particular event without affecting the project completion time. If a path has zero slack that means it is the critical path.

$$\text{Slack} = \text{LFT} - \text{EFT}$$

Q9. what are the applications PERT & CPM?

A. Construction of projects such as building, highways, houses or bridges

- Preparation of bids and proposals for large projects such as multipurpose projects
- Maintenance and planning of oil refineries, ship repairs and other such as large operations
- Development of new weapon systems and new products and services
- Manufacture and assembly of large items such as aeroplanes or ships repairs and other such as large operations

Simple projects such as home remodeling house keeping or painting and so on.

Q10. what are the limitations of Gantt chart?

This Gantt bar charts not useful for big projects, consisting of

large number of complex activities

1. It does not show the relationship between various operations. It is very difficult to find the sequence of various operations on the Gantt chart or the most probable date of completion.
2. Does to indicate the progress of work
3. It cannot reflect uncertainty or tolerance in the duration time estimated for various activities
4. It simply a scheduling technique, but not effective planning tool.

LAQ TYPES:

Q1.what is network analysis? What are the features of network analysis?

A.

**Net work analysis**: It refers to a number of techniques for the planning and control of complex projects. The basis of network planning is the representation of sequential relationships between activities by means of a network of lines and circles. The idea is to link the various activities in such a way that the overall time spent on the project is kept to a minimum.

**Features of Network Analysis**:

**Logical base of planning**: Network analysis is highly applicable at several stages of project management right from early planning stage of selecting right option from various alternative to scheduling stage and operational stage.

**Simple in nature**: Net work analysis is straightforward in concept and can be easily explained to any laymen. Data calculations are simple and for large projects computers can be used.

**Improves coordination and communication**: The graphs generated out of network analysis display simply and direct way the complex nature of various sub-divisions of project may, quickly perceive from the graph

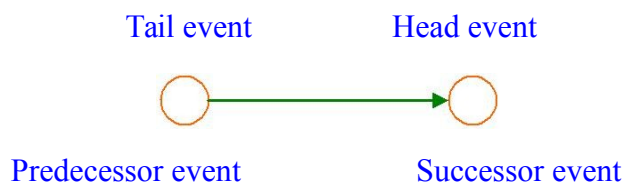
**Wider application**: The network analysis is applied to many types of projects. Moreover, they may be applied at several levels within a given project from a single department working on a sub-system to multi-plant

operations within corporation.

## Q2.Explain PERT basic terminology?

### A. PERT Basic Terminology:

Event: A event is specific instant of time which indicates the beginning or end of the activity event is also known as a junction or node. It is represented by a circle and the event number is written with in the circle.



Activity: Every project consists of number of job operations or tasks which are called activity.



Ex: Start machine installation Machine installation Completion of machine

### Classification of activities:

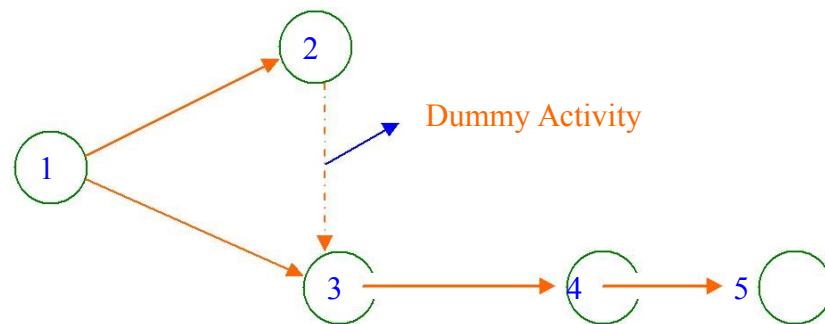
- 1) Critical activity
- 2) Non-Critical activity
- 3) Dummy activity

Critical activity: In a network diagram critical activities are those which if consume more than their estimated time, the project will be delayed. It shown with thick arrow.



Non-critical activity: Such activities have a provision of float or slack so that, even if they consume a specified time over and above the estimated

time. **Dummy activity**: When two activities start at the same instant of time like A and B the head event are jointed by dotted arrows and this is known as dummy activity.



### Q3.explain basic terminology of CPM?

A. **Critical Path**: Critical path is that path which consumes the maximum amount of time or resources. It is that path which has zero slack value.

**Slack**: Slack means the time taken to delay a particular event without affecting the project completion time. If a path has zero slack that means it is the critical path.

B.  
Slack = LFT – EFT

**Earliest Start Time (EST)**: It is the earliest possible time at which an activity can start, and is calculated by moving from first to last event in the network diagram.

**Earliest Finish Time (EFT)**: It is the earliest possible time at which an activity can finish

C.  
 $EFT = EST + \text{Duration of activity}$

**Latest Start Time (LST)**: It is the latest possible time by which an activity can start without delaying the date of completion of the project.

D.  
 $LST = LFT - \text{Duration of the activity}$

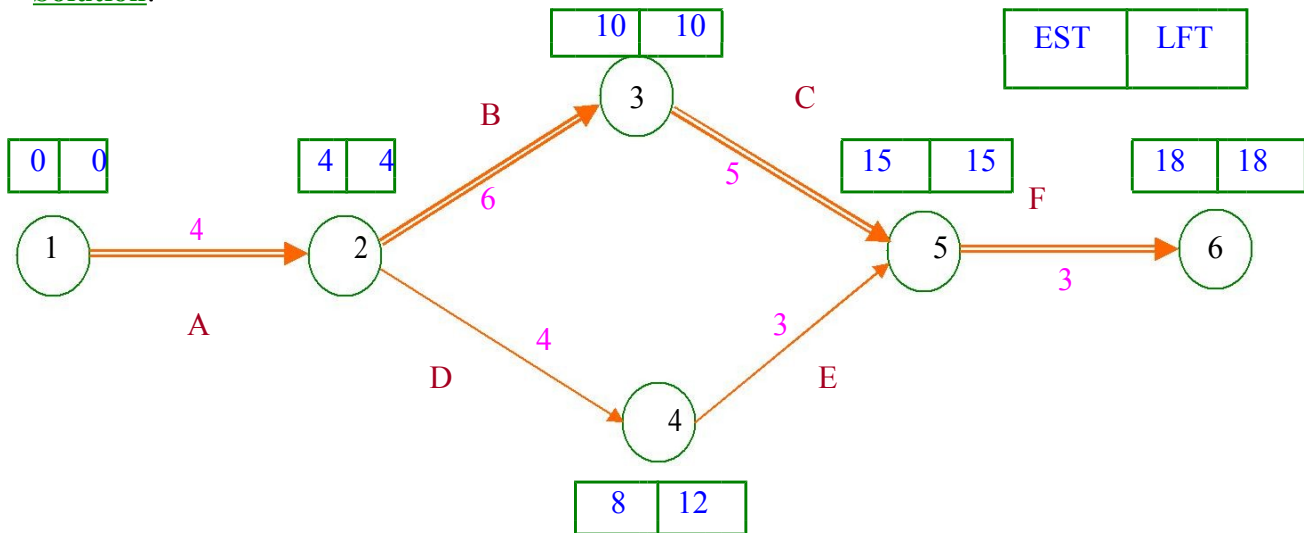
**Latest Finish Time (LFT)**: It is the latest time by which the activity must be completed. So that the scheduled date for the completion of the project may not be delayed. It is calculated by moving backwards.

**Problems:**

- 1) A small engineering project consists of 6 activities namely ABCDE & F with duration of 4, 6, 5, 4, 3 and 3 days respectively. Draw the network diagram and calculate EST, LST, EFT, LFT and floats. Mark the critical path and find total project duration.

Activity	A	B	C	D	E	F
Preceding activity	-	A	B	A	D	C,E
Duration	4	6	5	4	3	3

**Solution:**



**Critical path = A-B-C-F**

**Project duration = 18 days**

Activity	Duration	EST	LST	EFT	LFT	Total float	Free float	Independent float
A	4	0	0	4	4	0	0	0
B	6	4	4	10	10	0	0	0
C	5	10	10	15	15	0	0	0
D	4	4	8	8	12	4	0	0
E	3	8	12	11	15	4	4	0
F	3	15	15	18	18	0	0	0

**Note:**  $LST = LFT -$

activity duration

$LFT = EST +$

activity duration

Total float =  $LST - EST$  or  $LFT - EFT$

Free float =  $EST$  of Head Event –  $EST$  of Trail Event – Activity duration  
 Independent float =  $EST$  of Head event –  $LFT$  of Trail event – Activity duration

A small engineering project consists of six activities. The three time estimates in number days for each activity are given below.

Activity	$t_o$	$t_m$	$t_p$
1-2	2	5	8
2-3	1	1	1
3-5	0	6	18
5-6	7	7	7
1-4	3	3	3
4-5	2	8	14

**Find out:**

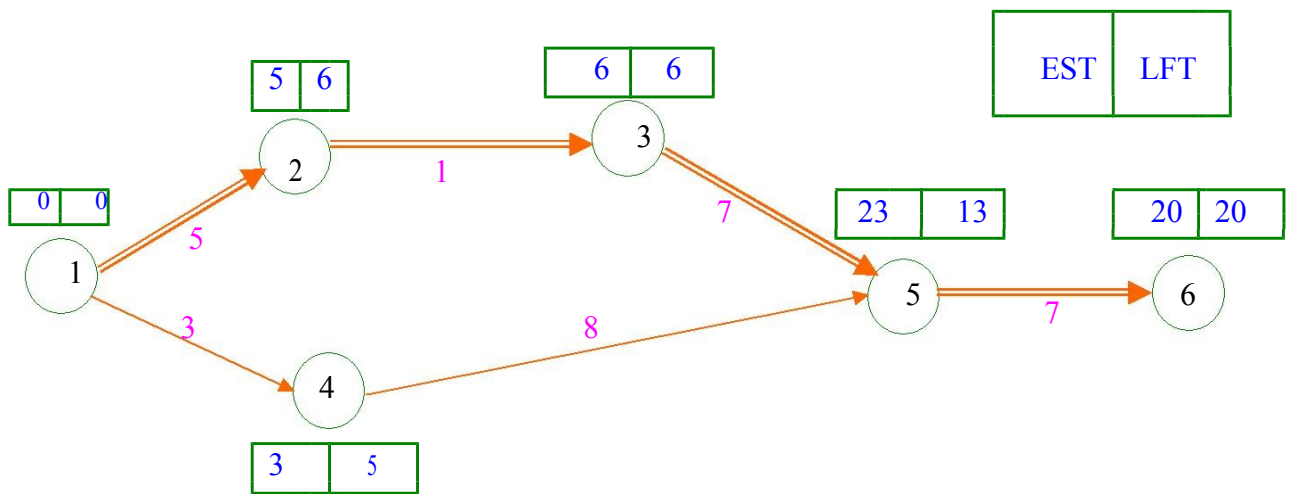
1. Calculate the values of expected time ( $t_e$ ), and S.D variance ( $\sigma$  ( $v_i$ )) of each activity
7. Draw the network diagram and mark  $t_e$  on each activity



8. Calculate EST and LFT and mark them on the net work diagram
9. Calculate total slack for each activity
10. Identify the critical path and mark on the net work diagram
11. Probability of completing project in 25 days.

**Solution:**

Activity	$t_o$	$t_m$	$t_p$	$t_e = \frac{t_o + 4t_m + t_p}{6}$ (Duration)	$S.D = \frac{t_p - t_o}{6}$	$Variance = \sigma^2 = \left(\frac{t_p - t_o}{6}\right)^2$
1-2	2	5	8	5	1	1
2-3	1	1	1	1	0	0
3-5	0	6	18	7	3	9
5-6	7	7	7	7	0	0
1-4	3	3	3	3	0	0
4-5	2	8	14	8	2	4



Activity	EST	LFT	LST	EFT	Slack
1-2	0	5	0	5	0

2-3	5	6	5	6	0
3-5	6	13	6	13	0
5-6	13	20	13	20	0
1-4	0	5	2	3	2
4-5	3	13	5	11	2

**Critical path = 1-2-3-5-6 = 20 days**

Probability for completing project in 25 days:

$$Z = \frac{t_s - t_e}{\sigma}$$

Here  $t_s = 25$  days,  $t_e = 20$  days,  $\sigma = \sqrt{1.090} = 1.044$

$$z = \frac{25 - 20}{\sqrt{1.090}} = \frac{5}{1.044} = 4.79$$

From the table value ( $z = 1.50$ ) = **93.32%**