**Subject Code : 17MCA3C16**

**JAMAL MOHAMED COLLEGE (Autonomous)**

**TIRUCHIRAPPALLI – 620 020**

**Objective Type Questions**

**Department of Computer Science**

**Semester : III PG/UG : PG- MCA**

**Title of the Paper : OPTIMIZATION TECHNIQUES**

1. ……………………….. is a scientific approach to problems solving for executive management.

a) Operations Research b) Numerical Method

c) Algorithm d) Simulation Method

2. The first step in O.R. is to ………………………

a) construct a model

b) validate the model

c) derive the solution from the model

d) identify the problem correctly

3. Which of the following is not correct about LPP?

a) All the constraints must be linear relationships

b) Objective function must be linear

c) All the decision variables must be non-negative

d) All the constraints must be either ≤ or ≥ type

4. ………………… method is used to solve LPP with only two decision variables.

a) Graphical b) Critical Path c) Inventory d) Numerical

5. The general LPP is in *canonical form*, if the constraints are …………………..

a) strict equations

b) inequalities of ≤ type

c) inequalities of ≥ type

d) inequalities of both ≤ and ≥ type

6. The general LPP is in *standard form*, if the constraints are …………………..

a) strict equations

b) inequalities of ≤ type

c) inequalities of ≥ type

d) inequalities of both ≤ and ≥ type

7. ……………….. variables are used to convert the inequalities of the type ≤ into equations.

a) Surplus b) Slack c) Artificial d) Decision

8. ……………….. variables are used to convert the inequalities of the type ≥ into equations.

a) Artificial b) Slack c) Surplus d) Decision

9. Which of the following is not associated with LPP?

a) feasible solution b) infeasible solution

c) optimal solution d) quadratic equation

10. Optimal solution in a LPP is to …………………….

a) satisfy the non-negativity constraints

b) minimize the objective function

c) maximize or minimize the objective function

d) maximize the objective function

11. In the *general form of LPP*, the constraints should be of …………………..

a) strict equations

b) ≤ type

c) ≥ type

d) ≤, =, ≥ type

12. For maximization LPP, the Simplex Method is terminated when all the net-evaluations are …………………

a) zero b) negative c) non-negative d) non-positive

13. The values of the decision variables which satisfy the constraints and non-negativity conditions is called the …………………

a) solution b) feasible solution c) BFS d) basic solution

14. A solution which can be increased or decreased the value of the objective function indefinitely is known as ……………………

a) infeasible solution b) unbounded solution c) BFS d) optimal solution

15. A feasible solution to an LPP, which is also a basic solution to the problem is called a ……………… to the LPP.

a) BFS b) unbounded solution c) infeasible solution d) optimal solution

16. A basic solution to the system is called ……………… if one or more of the basic variables vanish.

a) non-degenerate b) optimal c) feasible d) degenerate

17. In two-phase simplex algorithm of Phase I, if Max z\* < 0 and at least one artificial variable is present in the basis with positive value then the original LPP has ……………….

a) an optimal solution b) an infeasible solution

c) an unbounded solution d) degenerate solution

18. If a negative value appears in the solution values column of the simplex method, then

………………………………………….

a) the basic solution is optimal

b) the basic solution is infeasible

c) the basic solution is unbounded

d) the basic solution is degenerate

19. For maximization LPP, the objective function coefficient for an artificial variable is …….

a) +M b) zero c) +1 d) - M

20. In final simplex table, if for at least one non-basic variable, then there will be …………….

a) an unbounded solution b) infeasible solution

c) alternate solution d) cycling

21. The transportation problem is balanced, if ……………………………………

a) total demand and total supply are equal and the number of sources equals the number

of destination

b) total demand equals total supply irrespective of the number of sources and

destinations

c) number of sources matches with the number of destinations

d) total demand not equals total supply

22. The initial solution of a T.P. can be obtained by applying any known method. However, the only condition is that ……………………………….

a) the solution must be optimum b) the solution should be non-degenerate

c) the rim conditions are satisfied d) the solution should be degenerate

23. The solution to a T.P. with m-sources and n-destinations is feasible, if the number of allocations are ……………..

a) m+n-1 b) m+n+1 c) m+n d) mxn

24. The initial solution of a T.P. is obtained by ……………………….

a) Hungarian Method b) Simplex Method

c) MODI Method d) VAM

25. The optimal solution of a T.P. is obtained by …………………..

a) Hungarian Method b) Big-M Method

c) MODI Method d) North-West Corner Rule

26. A BFS for the general T.P. is said to be non-degenerate if the number of occupied cells is ……………………………..

a) less than or equal to m+n-1 b) greater than or equal to m+n-1

c) less than m+n d) equal to m+n-1

27. A BFS for the general T.P. is said to be degenerate if the number of occupied cells is ……………………………..

a) less than m+n-1 b) greater than or equal to m+n-1

c) less than m+n d) less than or equal to m+n-1

28. Which of the following is correct related to T.P?

a) Lead time b) Entering variable

c) Float d) Waiting time

29. When total supply is not equal to total demand in a transportation problem, the problem is said to be ………………..

a) balanced b) degenerate c) unbalanced d) non-degenerate

30. Maximization T.P. is transformed into a minimization problem by subtracting all the elements from …………….. in the transportation table.

a) highest element b) one c) zero d) lowest element

31.The A.P. is said to be balanced, if …………………………

a) the number of rows equals number of columns

b) number of sources matches with the number of destinations

c) total demand equals total supply

d) the matrix is not a square matrix

32.If there are n workers and n jobs, there would be ………………

a) n solutions b) n! solutions c) (n-1)! solutions d) n-1 solutions

33. In an assignment problem involving four workers and three jobs, total number of assignments possible are …………………

a) 4 b) 3 c) 7 d) 12

34. The minimum number of lines covering all zeros in a reduced cost matrix of order n can be ………………..

a) at least n b) n-1 c) n+1 d) at most n

35.In marking assignments, which of the following should be preferred?

a) only that row which have single zero

b) only that column which have sing zero

c) only column having more than one zero

d) only row having more than one zero

36.The method used for solving an assignment problem is called …………………

a) MODI Method b) North-West Corner Rule

c) Hungarian Method d) Graphical Method

37. A salesman has to visit n cities. He wishes to start from a particular city, visit each city once, and then return to his starting point. The objective is to select the sequence in which the cities are visited in such a way that his total travelling time is minimized. This problem is known as ………………………….

a) Transportation Problem b) Linear Programming Problem

c) Inventory Problem d) TSP

38. An assignment problem can be formulated as a ………………………. which, in turn, is itself a special case of an LPP.

a) Network Problem b) Transportation Problem

c) Queueing Model d) Inventory Model

39. When the number of rows is not equal to the number of columns in an assignment problem, the problem is said to be ………………..

a) unbalanced b) degenerate c) non-degenerate d) balanced

40.Maximization assignment problem is transformed into a minimization problem by

a) adding each entry in a column from the maximum value in that column

b) adding each entry in a row from the maximum value in that row

c) subtracting each entry in a column from the maximum value in that column

d) subtracting each entry in the table from the maximum value in that table

41. A ……………… is a well defined collection of activities.

a) project b) model c) network d) node

42. ……………… is a task or item of work to be done that consumes time, effort, money or other resources.

a) An activity b) A project c) An event d) A float

43. A node is generally represented by ……………… symbol.

a) square b) dotted arrow c) arrow d) circle

44. ……………….. does not consume any resource.

a) A dummy activity b) An activity c) A node d) A project

45. The expected time in PERT model is calculated by …………….

a)  b)  c)  d) 

46. Variance of an activity in PERT model is determined by …………….

1.  b)  c)  d) 

47. ………………. time is the shortest possible time to complete the activity if all goes well.

a) Slack b) Optimistic c) Most likely d) Pessimistic

48. ………………. time is the longest possible time that an activity could take if every thing goes wrong.

a) Optimistic b) Most likely c) Pessimistic d) Slack

49. ………………. time is the estimate of the normal time an activity would take.

a) Most likely b) Optimistic c) Pessimistic d) Slack

50. In critical path analysis, the word CPM means ………………………..

a) Critical Path Method b) Critical Project Management

c) Critical Path Management d) Crash Planning Method

51. In critical path analysis, CPM is ………………………..

a) event oriented b) deterministic in nature

c) probabilistic in nature d) dynamic in nature

52. In critical path analysis, PERT is ………………………..

a) event-oriented b) deterministic in nature

c) used for repetitive jobs d) activity-oriented

53. …………………. is a probabilistic model with uncertainty in activity duration.

a) CPM b) PERT c) LPP d) Inventory Model

54. In critical path analysis, CPM is ………………………..

a) used for non-repetitive jobs b) activity-oriented

c) probabilistic in nature d) dynamic in nature

55. The objective of network analysis is to ……………………………..

a) minimize total project cost b) maximize total project cost

c) minimize total project duration d) minimize production delays

56. If an activity has zero slack, it implies that ………………………………..

a) it is a dummy activity

b) it lies on the critical path

c) there are more than one critical paths

d) the project is progressing well

57. PERT stands for ………………………………………………………….

a) Project Evaluation Review Technique

b) Planning Evaluation Review Technique

c) Project Estimation Review Tool

d) Programme Evaluation Review Tool

58. The activity which can be delayed without affecting the execution of the immediate succeeding activity is determined by ……………………..

a) total float b) free float

c) independent float d) interfering float

59. The …………………. of an activity represents the amount of time by which an activity can be delayed without delay in the project completion date.

a) interfering float b) free float

c) independent float d) total float

60 The …………….. is the difference between its latest time and its earliest time.

a) independent float b) free float

c) event float d) interfering float

61. …………………… are maintained to meet uncertainties of demand and supply.

a) Buffer inventories

b) Movement inventories

c) Anticipation inventories

d) Decoupling inventories

62. Lot-size inventories are also called ………………………

a) Buffer inventories

b) Movement inventories

c) Anticipation inventories

d) Cyclic inventories

63. When the resource involved is material or goods, it is referred as …………………

a) Buffer b) Inventory c) Demand d) Product

64. ………………………… is the process of deciding what and how much of various items are to be kept in stock.

a) Queueing Model b) Lead Time

c) Inventory Control d) Quality Control

65. The costs associated with obtaining goods through purchasing or production are known as …………………….

a) Ordering Costs b) Holding Costs c) Production Costs d) Shortage Costs

66. The costs associated with carrying the goods in stock is known as ………………..

a) Salvage Costs b) Revenue Costs c) Stock out Costs d) Holding Costs

67. The penalty cost for running out of stock is known as ……………………

a) Holding Costs b) Ordering Costs c) Shortage Costs d) Production Costs

68. The cost associated with the setting up of machinery before starting production is called …………………………..

a) Holding Costs b) Set-up Costs c) Shortage Costs d) Production Costs

69. The number of units required per period is called ……………..

a) Demand b) Lead Time c) Time Horizon d) ROL

70. The time gap between placing of an order and its actual arrival in the inventory is known as ……………..

a) Lead Time b) Demand c) Ordering Costs d) Order Cycle

71. The time period over which the inventory level will be controlled is called the …………..

a) Lead Time b) Slack Time c) Time Horizon d) Order Cycle

72. The level between maximum and minimum stock, at which purchasing activities must start for replenishment, is known as ……………..

a) Demand b) Lead Time c) Optimum Level d) ROL

73. EOQ stands for ………………..

a) Economic Order Quantity b) Economy Ordering Quantity

c) Economic Order Quality d) Estimated Order Quantity

74. Compute EOQ, if 

a) 82.8 b) 58.6 c) 43.5 d) 85

75. An example of ordering costs includes ……………………

a) Cost of Idle Equipment b) Testing the Equipment and Training Costs

c) Rent for Space d) Manufacturing Overhead

76. The cost of insurance and taxes are included in ……………………

a) Production Costs b) Set-up Costs c) Carrying Costs d) Penalty Costs

77. Re-order level is calculated as …………………………………..

a)  b) B + Q\*

c) B + Normal Lead time Consumption d) (2B + Q\*)/2

78. The Economic Order Quantity is calculated as ……………………….

a)  b)  c)  d) 

79. The order cost per order of an inventory is Rs. 400 with an annual carrying cost of Rs. 10 per unit. The EOQ for an annual demand of 2000 units is ……………….

a) 440 b) 400 c) 480 d) 500

80. Which of the following is not an inventory?

a) Machines b) Raw Materials

c) Finished Products d) Consumable Tools

81. Queue can form only when ………………………………………………

a) arrivals exceed service capacity

b) arrivals equals service capacity

c) service facility is capable to serve all the arrivals at a time

d) There are more than one service facilities

82. When there are more than one servers, customer behavior in which he moves from one queue to another is known as …………………………..

a) balking b) jockeying c) reneging d) alternating

83. If a customer decides not to enter the queue because of its length, he is said to have ………………….

a) alternated b) jockeyed c) reneged d) balked

84. If a customer enters the queue, but after some time loses patience and decides to leave, then he is said to have …………………..

a) alternated b) jockeyed c) reneged d) balked

85. ………………. stands for a number of customers waiting to be serviced.

a) Inventory b) Customer c) Waiting line d) Server

86. For a poisson exponential, single server and infinite population queueing model, which of the following is not correct?

a)  b) 

c)  d) 

87. For a poisson exponential, single server and infinite population queueing model, which of the following is correct?

a)  b) 

c)  d) 

88. The calling population is assumed to be infinite, when ……………………………..

a) arrivals are independent of each other

b) arrivals are dependent upon each other

c) capacity of the system is infinite

d) service rate is faster than arrival rate

89. The traffic intensity is calculated by ………………….

a)  b)  c)  d) 

90. The ratio between arrival rate and service rate is known as ……………

a) lead time b) service discipline

c) traffic intensity d) queue

91. ……………………… is a rule according to which customers are selected for service when a queue has been formed.

a) Arrival Process b) Service Mechanism

c) Capacity of the System d) Queue Discipline

92. Expected number of customers in the system is calculated by ………………..

a)  b)  c)  d) 

93. Average waiting time in the system is determined by …………………….

a)  b)  c)  d) 

94. Which of the following is not a part of queuing system?

a) waiting line b) demand c) arrival rate d) service discipline

95. When the arrival rate is 10 sets per day and service rate is 16 sets per day, the value of ‘’ in queueing system is ……………

a) 0.0625 b) 1.6 c) 0.625 d) 0.10

96. In the queueing model, (M/M/1): (∞/ FIFO), the number of servers is …………….

a) 1 b) M c) FIFO d) ∞

97. In the queueing model, (M/M/C): (∞/ FIFO), the number of servers is …………….

a) 1 b) C c) M d) ∞

98. If  , What is the probability that the system is empty?

a) 1.33 b) 0.20 c) 0.75 d) 0.25

99. Prob(Queue Size ≥ n ) is ……………

a)  b)  c)  d) 

100. Which of the following is correct related to queueing system?

a) Arrival Process follows the Poisson Distribution

b) Service times follow the Uniform Distribution

c) The arrival time is 

d) The utilization factor is 

**ANSWERS:**

1. a) Operations Research

2. d) identify the problem correctly

3. d) All the constraints must be either ≤ or ≥ type

4. a) Graphical

5. b) inequalities of ≤ type

6. a) strict equations

7. b) Slack

8. c) Surplus

9. d) quadratic equation

10 c) maximize or minimize the objective function

11. d) ≤, =, ≥ type

12. c) non-negative

13. b) feasible solution

14. b) unbounded solution

15. a) BFS

16. d) degenerate

17. b) an infeasible solution

18. b) the basic solution is infeasible

19. d) - M

20. c) alternate solution

21. b) total demand equals total supply irrespective of the number of sources and destinations

22. c) the rim conditions are satisfied

23. a) m+n-1

24. d) VAM

25. c) MODI Method

26. d) equal to m+n-1

27. a) less than m+n-1

28. b) Entering variable

29. c) unbalanced

30. a) highest element

31. a) the number of rows equals number of columns

32. b) n! solutions

33. b) 3

34. d) at most n

35. a) only that row which have single zero

36. c) Hungarian Method

37. d) TSP

38. b) Transportation Problem

39. a) unbalanced

40. d) subtracting each entry in the table from the maximum value in that table

41. a) project

42. a) An activity

43. d) circle

44. a) A dummy activity

45. c) 

46. d) 

47. b) Optimistic

48. c) Pessimistic

49. a) Most likely

50. a) Critical Path Method

51. b) deterministic in nature

52. a) event-oriented

53. b) PERT

54. b) activity-oriented

55. c) minimize total project duration

56. b) it lies on the critical path

57. a) Project Evaluation Review Technique

58. b) free float

59. d) total float

60. b) free float

61. a) Buffer inventories

62. d) Cyclic inventories

63. b) Inventory

64. c) Inventory Control

65. a) Ordering Costs

66. d) Holding Costs

67. c) Shortage Costs

68. b) Set-up Costs

69. a) Demand

70. a) Lead Time

71. c) Time Horizon

72. d) ROL

73. a) Economic Order Quantity

74. a) 82.8

75. b) Testing the Equipment and Training Costs

76. c) Carrying Costs

77. c) B + Normal Lead time Consumption

78. d) 

79. b) 400

80. a) Machines

81. a) arrivals exceed service capacity

82. b) jockeying

83. d) balked

84. c) reneged

85. c) Waiting line

86. a) 

87. d) 

88. a) arrivals are independent of each other

89. b) 

90. c) traffic intensity

91. d) Queue Discipline

92. a) 

93. d) 

94. b) demand

95. c) 0.625

96. a) 1

97. b) C

98. d) 0.25

99. c) 

100. a) Arrival Process follows the Poisson Distribution