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(To be filled in the OMR Sheet)

प्रश्नपुस्तिका क्रमांक
Question Booklet No.

O.M.R. Serial No. | | | | | | | | |

प्रश्नपुस्तिका सीरीज
Question Booklet Series
B

BBA (Fourth Semester) Examination, July-2022

BBA 406(N)

Operations Research

Time : 1:30 Hours **Maximum Marks-100**

जब तक कहा न जाय, इस प्रश्नपुस्तिका को न खोलें

निर्देश : –

1. परीक्षार्थी अपने अनुक्रमांक, विषय एवं प्रश्नपुस्तिका की सीरीज का विवरण यथास्थान सही– सही भरें, अन्यथा मूल्यांकन में किसी भी प्रकार की विसंगति की दशा में उसकी जिम्मेदारी स्वयं परीक्षार्थी की होगी।
2. **इस प्रश्नपुस्तिका में 100 प्रश्न हैं, जिनमे से केवल 75 प्रश्नों के उत्तर परीक्षार्थियों द्वारा दिये जाने है। प्रत्येक प्रश्न के चार वैकल्पिक उत्तर प्रश्न के नीचे दिये गये हैं। इन चारों में से केवल एक ही उत्तर सही है। जिस उत्तर को आप सही या सबसे उचित समझते हैं, अपने उत्तर पत्रक (O.M.R. ANSWER SHEET) में उसके अक्षर वाले वृत्त को काले या नीले बाल प्वांइट पेन से पूरा भर दें। यदि किसी परीक्षार्थी द्वारा किसी प्रश्न का एक से अधिक उत्तर दिया जाता है, तो उसे गलत उत्तर माना जायेगा।**
3. प्रत्येक प्रश्न के अंक समान हैं। आप के जितने उत्तर सही होंगे, उन्हीं के अनुसार अंक प्रदान किये जायेंगे।
4. सभी उत्तर केवल ओ०एम०आर० उत्तर पत्रक **(O.M.R. ANSWER SHEET)** पर ही दिये जाने हैं। उत्तर पत्रक में निर्धारित स्थान के अलावा अन्यत्र कहीं पर दिया गया उत्तर मान्य नहीं होगा।
5. ओ०एम०आर० उत्तर पत्रक **(O.M.R. ANSWER SHEET)** पर कुछ भी लिखने से पूर्व उसमें दिये गये सभी अनुदेशों को सावधानीपूर्वक पढ़ लिया जाय।
6. परीक्षा समाप्ति के उपरान्त परीक्षार्थी कक्ष निरीक्षक को अपनी ओ०एम०आर० शीट उपलब्ध कराने के बाद ही परीक्षा कक्ष से प्रस्थान करें।
7. निगेटिव मार्किंग नहीं है।

महत्वपूर्ण : – **प्रश्नपुस्तिका खोलने पर प्रथमतः जॉच कर देख लें कि प्रश्नपुस्तिका के सभी पृष्ठ भलीभॉति छपे हुए हैं। यदि प्रश्नपुस्तिका में कोई कमी हो, तो कक्ष निरीक्षक को दिखाकर उसी सीरीज की दूसरी प्रश्नपुस्तिका प्राप्त कर लें।**

K-353

1. PERT follows a:

   (A) Beta distribution

   (B) Poisson distribution

   (C) Chi square distribution

   (D) Gamma distribution

2. Graphical method of linear programming is useful when the number of decision variables are _____.

   (A) 1

   (B) 2

   (C) 3

   (D) 4

3. If the optimal simplex table $Zj - Cj = o$ value indicates:

   (A) Alternative solution

   (B) Bounded solution

   (C) Infeasible solution

   (D) Unbounded solution

4. If an activity has zero slack, it implies that _____.

   (A) The project is progressing well

   (B) It is a dummy activity

   (C) It lies on the critical path

   (D) It lies on a non-critical path

5. The dual of the dual is _____.

   (A) Dual- primal

   (B) Primal dual

   (C) Dual

   (D) Primal

6. An activity is represented by a/an _____.

(A) Arrow

(B) Straight line

(C) Curve

(D) Are

7. The similarity between assignment problem and transportation problem is_____.

(A) Both are rectangular matrices

(B) Both are square matrices

(C) Both can be solved by graphical method

(D) Both have objective function and non negative constraints

8. The penalty for non taking correct decision is known as :

(A) Fine

(B) Loss

(C) Cost

(D) Opportunity cost

9. In a given system of m simultaneous linear equations in n unknowns $(m < n)$ there will be _____.

(A) n basic variables

(B) m basic variables

(C) $(n - m)$ basic variables

(D) $(n + m)$ basic variables

10. Pessimistic time and optimistic time of completion of an activity are given as 10 days and 4 days respectively, the variance of the activity will be:

(A) 1

(B) 6

(C) 12

(D) 18

11. Which of the following statement is not true?

(A) PERT is probabilistic

(B) CPM is deterministic

(C) In CPM probability to complete a project in given duration is calculated

(D) None of the above

12. For an activity the pessimistic, most likely and optimistic time are 10 days, 6 days, and 2 days respectively. The expected duration of activity based on beta distribution will be :

(A) 6 days

(B) 3 days

(C) 2 days

(D) 9 days

13. Crashing is to be applied on:

(A) Critical Activities

(B) Non-critical Activities

(C) Both (A) and (B)

(D) Critical Activities with positive slack

14. _____ are the representation of reality:

(A) Models

(B) Phases

(C) Both (A) and (B)

(D) None of the above

15. The best used of linear programming technique is to find an optimal use of:

(A) Money

(B) Manpower

(C) Machine

(D) All of the above

16. The objective functions and constraints are linear relationship between _____.

(A) Variables

(B) Constraints

(C) Functions

(D) All of the above

17. Who coined the term operation research?

(A) J.F. Mccloskey

(B) F.N. Trefethen

(C) P.F. Adams

(D) Both (A) and (B)

18. Probabilistic models are also known as:

(A) Deterministic models

(B) Stochastic models

(C) Dynamic models

(D) Static models

19. _____ models are obtained by enlarging or reducing the size of the item.

(A) Iconic models

(B) Analogue models

(C) Symbolic models

(D) None of the above

20. In _____ models there is risk & uncertainity.

(A) Deterministic models

(B) Probabilistic models

(C) Both (A) and (B)

(D) None of the above

21. Who defined or as scientific approach to problem solving for executive management?

(A) E.L. Arnoff

(B) H.M. Wagner

(C) P.M.S. Blackett

(D) None of the above

22. To find the optimal solution we apply:

(A) LPP

(B) VAM

(C) MODI

(D) Rim

23. An objective function is maximized when it is a _____ function.

(A) Passive

(B) Profit

(C) Cost

(D) None of the above

24. A set of values X_1, X_1, X_n which satisfies the constraints of the LPP is called_____?

(A) Solution

(B) Variable

(C) Linearity

(D) All of the above

25. The decision-maker's knowledge and experience may influence the decision making process when using the criterion of:

(A) Maximax

(B) Minimax regret

(C) Realism

(D) Maximin

26. The concept of utility is used to:

(A) Measure the utility to money

(B) Take into account aversion of risk

(C) Both (A) and (B)

(D) None of the above

27. The assignment problem:

(A) Requires that only one activity be assigned to each resource

(B) Is a special case of transportation problem

(C) Can be used to maximize resources

(D) All of the above

28. The qualitative approach to decision analysis is a:

(A) Logical approach

(B) Rational approach

(C) Scientific approach

(D) All of the above

29. For analyzing a problem, decision-maker moved normally study:

(A) Its qualitative aspects

(B) Its quantitative aspects

(C) Both (A) and (B)

(D) Neither (A) nor (B)

30. The another term commonly used for activity slack time is:

(A) Total float

(B) Free float

(C) Independent float

(D) All of the above

31. Activity on arrow (AOA) diagram is preferred over activity on node diagram because:

(A) AOA diagrams are simple to construct

(B) AOA diagrams give a better sense of time throughout a project

(C) AOA diagrams do not involve dummy activities

(D) All of the above

32. In time cost-trade-off function analysis:

(A) Cost decreases linearly as time increases

(B) Cost at normal time is zero

(C) Cost increases linearly as time increases

(D) None of the above

33. The decision making creation that should be used to achieve maximum long term pay-off is:

(A) EOL

(B) EMV

(C) Hurwicz

(D) All of the above

34. Essential characteristics of a decision model are:

(A) States of nature

(B) Decision alternative

(C) Payoff

(D) All of the above

35. While using Hurwicz criterion, the coefficient of realism ($\propto$):

(A) Represents the degree of optimism

(B) Represents the degree of pessimism

(C) Is the probability of a state of nature

(D) None of the above

36. Which of the following criterion is not applicable to decision making under risk?

(A) Maximize expected return

(B) Maximize return

(C) Minimize expect regret

(D) knowledge of likelihood occurrences of each state of nature

37. An assignment problem is a special case of transportation problem, where?

(A) No of rows equal to no. of columns

(B) All rim conditions are 1

(C) Value of each decision variable is either 0 or 1

(D) All of the above

38. An assignment problem can be solved by:

(A) Simplex method

(B) Transportation method

(C) Both (A) and (B)

(D) None of the above

39. The purpose of dummy row or column in an assignment problem is to:

(A) Obtain balance between total activities and total resources

(B) Present a solution from becoming degenerate

(C) provide a means of representing a dummy problem

(D) None of the above

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

(A) Adding each entry in columns from the maximum value in that column

(B) Subtracting each entry in a column from the maximum value in that column

(C) Subtracting each entry in the table from the maximum value in that table

(D) None of the above

41. The initial solution of a transportation problem can be obtained by applying any known method. However the only condition is that:

(A) the solution be optimal

(B) The rim conditions are satisfied

(C) The solutions not to be degenerate

(D) All of the above

42. When total supply is equal to total demand in a transportation problem the problem is said to be:

(A) Balanced

(B) Unbalanced

(C) Degenerate

(D) None of the above

43. One disadvantage of using NWCM is to fined initial solution to the transportation problem is that:

(A) It is complicated to used

(B) It leads to degenerate initial solution

(C) Both (A) and (B)

(D) None of the above

44. The degeneracy in the transportation problem indicates that:

(A) Dummy allocation (s) needs to be added

(B) The problem has no feasible solution

(C) The multiple optimal solution exist

(D) Both (A) and (B) but not (C)

45. The process of modifying an or model to observe the effect upon its output is called:

(A) Sensitivity analysis

(B) Cost benefit analysis

(C) Model validation

(D) Input variation

46. Operations research practitioners do not:

(A) Take responsibility for solution implementation

(B) Collect essential data

(C) Predict future actions / operations

(D) Build more than one model

47. The qualitative approach to decision analysis relies on:

(A) Experience

(B) Judgement

(C) Intuition

(D) All of the above

48. An optimization model:

(A) Mathematically provides the best decision

(B) Provides decision within its limited context

(C) Helps in evaluating various alternatives constantly

(D) All of the above

49. Managerial decision are based on:

(A) An evaluation of qualitative data

(B) The use of qualitative factors

(C) Numbers produced by formal models

(D) All of the above

50. A constraint in an LP model restricts:

(A) Value of objective function

(B) Value of decision variable

(C) Use of available resources

(D) All of the above

51. Operation research analysis do not:

(A) Predict future operations

(B) Collect relevant data

(C) Build more than one model

(D) Recommend decision and accept

52. Decision variables are:

(A) Controllable

(B) Uncontrollable

(C) Parameters

(D) None of the above

53. A model is:

(A) An essence of reality

(B) An approximation

(C) An idealization

(D) All of the above

54. A constraint in an LP Model restricts:

(A) Value of objective function

(B) Use of the available resources

(C) Value of a decision variable

(D) All of the above

55. The solution space (region) of an LP problem is unbounded due to:

(A) An incorrect formulation of the LP model

(B) Objective function is unbalanced

(C) Both (A) and (B)

(D) Neither (A) nor (B)

56. Shadow price indicates how much one unit change in the resource value will change the?

(A) Optimally range of an objective function

(B) Optimal value of the objective function

(C) Value of the basic variable in the optimal solution

(D) None of the above

57. If dual has an unbounded solution, primal has:

(A) No feasible solution

(B) Unbounded solution

(C) Feasible solution

(D) None of the above

58. If there are n workers and n jobs there would be:

(A) n! solutions

(B) (n – 1)! solutions

(C) $(n!)^n$ solutions

(D) n solutions

59. For a salesman who has to visit n cities, following are the ways of his tour plan?

(A) n!

(B) (n + 1)!

(C) (n – 1)!

(D) n

60. The method used for solving an assignment problem is called:

(A) Reduced Matrix Method

(B) Modi Method

(C) Hungarian Method

(D) None of the above

61. If an activity has zero slack, it implies that:

(A) It lies on the critical path

(B) It is a dummy activity

(C) The project is progressing well

(D) None of the these

62. Network model have advantage in terms of project:

(A) Planning

(B) Scheduling

(C) Controlling

(D) All of these

63. Dummy activity is used in the network diagram when:

(A) Two parallel activities have the same tail and heal events

(B) Delaying any activity affects project completion time

(C) That activity has not much importance on project completion

(D) None of these

64. Decision Nodes are represented by:

(A) Disks

(B) Squares

(C) Circles

(D) Triangles

65. In PERT the span of time between the optimistic and pessimistic time of an activity is:

(A) 3σ

(B) 6σ

(C) 12σ

(D) None of the above

66. The objective of network analysis is to:

(A) Minimize total project duration

(B) Minimize total project cost

(C) Minimize production delays, interruption and conflicts

(D) All of the above

67. 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) None of the above

68. The critical path satisfy the condition that:

(A) $\mathrm{Ei} = \mathrm{Li}$ and $\mathrm{Ej} = \mathrm{Lj}$

(B) $\mathrm{Lj} - \mathrm{Ei} = \mathrm{li} - \mathrm{Lj}$

(C) $\mathrm{Lj} - \mathrm{Ei} = \mathrm{Li} - \mathrm{Ej} = \mathrm{c}$ (constant)

(D) All of the above

69. The slack for an activity is equal to:

(A) $\mathrm{LF} - \mathrm{LS}$

(B) $\mathrm{EF} - \mathrm{ES}$

(C) $\mathrm{LS} - \mathrm{ES}$

(D) None of the above

70. Float or slack analysis is useful for:

(A) Projects behind the schedule only

(B) Projects ahead of the schedule only

(C) Both (A) and (B)

(D) None of the above

71. The solution to a transportation problem with m rows (suppliers) and n-colounms (destination) is feasible if number of positive allocations are:

(A) $m + n$

(B) $m \times n$

(C) $m + n - 1$

(D) $m + n + 1$

72. The initial solution of a transportation problem can be obtained by applying any known method. However, the only condition is that:

(A) The solution be optimal

(B) The rim conditions are satisfied

(C) The solution not be degenerate

(D) All of the above

73. One disadvantage of NWCM is find initial solution to the transportation problem is that:

(A) It is complicated to use

(B) It does not take into account the cost of transportation

(C) It leads to degenerate initial solution

(D) All of the above

74. The dummy sources or destination in a transportation problem is added to:

(A) Satisfy rim condition

(B) Present solution from becoming degenerate

(C) Ensure that total cost does not exceed a limit

(D) None of the above

75. A type of decision-making environment is:

(A) Certainty

(B) Uncertainty

(C) Risk

(D) All of the above

76. Which of the following criteria is not used for decision making under uncertainity?

(A) Maximin

(B) Maximax

(C) Minimax

(D) Minimize the expected loss

77. The minimum expected opportunity loss (EOL) is:

(A) Equal to EVPI

(B) Minimum regret

(C) Equal to EMV

(D) Both (A) and (B)

78. The value of coefficient of optimism ($\propto$) is needed while using the criterion of:

(A) Equally Likely

(B) Maximin

(C) Realism

(D) Minimax

79. The difference bet^{n} the expected profit under condition of risk and the expected profit with perfect information is:

(A) Expected value of perfect information

(B) Expected marginal loss

(C) Expected opportunity loss

(D) None of the above

80. The concept of utility is used to:

(A) Measure the utility of money

(B) Take into account aversion of risk

(C) Both (A) and (B)

(D) None of the above

81. A feasible solution to a linear programming problem _____.

(A) Must satisfy all the constraints of the problem simultaneously

(B) Need not satisfy all of the constraints

(C) Must optimize the value of the objective questions

(D) None of the above

82. An optimal assignment requires that the maximum number of lines which can be drawn through squares with zero opportunity cost should be equal to the number of:

(A) Rows or columns

(B) Rows and columns

(C) Rows + columns – 1

(D) None of the above

83. A set of feasible solution to a linear programming problem is:

(A) Convex

(B) Polygon

(C) Triangle

(D) Bold

84. In a linear programming problem functions to be maximized or minimized are called _____.

(A) Constraints

(B) Objective function

(C) Basic solution

(D) Feasible solution

85. Key element is also known as _____.

(A) Slack

(B) Surplus

(C) Artificial

(D) Pivot

86. To resolve degeneracy at the initial solution, a very small quantity is allocated in _____cell.

(A) Occupied

(B) Unoccupied

(C) No

(D) Finite

87. The coefficient of slack/ surplus variables in the objective functions are always assumed to be:

(A) 0

(B) 1

(C) M

(D) – M

88. The number of time estimates involved in PERT problem is _____.

(A) 1

(B) 2

(C) 3

(D) 4

89. The assignment problem is always a _____ matrix.

(A) Circle

(B) Square

(C) Rectangle

(D) Triangle

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

(A) At the most n

(B) At the least n

(C) n – 1

(D) n + 1

91. In the network, one activity may connect any _____ nodes.

(A) 1

(B) 2

(C) 3

(D) 4

92. For finding an optimum solution in transportation problem _____ method is used.

(A) Simple x

(B) Big - M

(C) Modi

(D) Hungarian

93. The linear programming problem that can be solved by graphical method has ____.

(A) Linear constraints

(B) Quadratic constraints

(C) Non linear constraints

(D) Bi-quadratic constraints

94. In a transportation table, an ordered set of _____ or more cells is said to form a loop.

(A) 2

(B) 3

(C) 4

(D) 5

95. In a network diagram an event is denoted by the symbol _____.

(A) Arrow

(B) Straight line

(C) Curve

(D) Circle

96. _____ is used for non-repetitive jobs.

(A) Queue

(B) Replacement

(C) CPM

(D) PERT

97. A activity in a network diagram is said to be _____ if the delay in its start will further delay the project completion time.

(A) Forward pass

(B) Backward pass

(C) Critical

(D) Non-critical

98. An iso-profit line represents _____.

(A) A boundary of feasible region

(B) An infinite number of solution all of which yield the same cost

(C) An infinite number of solutions all of which yield the same profit

(D) An infinite number of optimal solution

99. The difference between free float and tail event slack is _____.

(A) Total float

(B) Independent float

(C) Interference float

(D) Slack

100. Slack is also known as _____.

(A) Float

(B) Event

(C) Activity

(D) Path

******

Rough Work / रफ कार्य

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