Roll. No. .....

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

Question Booklet Number

B.Com. (Hons.) (SEM.-IV) EXAMINATION, 2025-26

COMMERCE

(Operations Research)

[CODE : BCH-403]

Paper Code							
A	9	0	1	0	2	8	T

Question Booklet Series
D

Time : 1 : 30 Hours **Max. Marks : 75**

Instructions to the Examinee :

1. Do not open the booklet unless you are asked to do so.
2. The booklet contains 100 questions. Examinee is required to answer 75 questions in the OMR Answer-Sheet provided and not in the question booklet. All questions carry equal marks.
3. Examine the Booklet and the OMR Answer-Sheet very carefully before you proceed. Faulty question booklet due to missing or duplicate pages/questions or having any other discrepancy should be got immediately replaced.
4. Four alternative answers are mentioned for each question as - A, B, C & D in the booklet. The candidate has to choose the correct / answer and mark the same in the OMR Answer-Sheet as per the direction :

(Remaining instructions on last page)

परीक्षार्थियों के लिए निर्देश :

1. प्रश्न-पुस्तिका को तब तक न खोलें जब तक आपसे कहा न जाए।
2. प्रश्न-पुस्तिका में 100 प्रश्न हैं। परीक्षार्थी को 75 प्रश्नों को केवल दी गई OMR आन्सर-शीट पर ही हल करना है, प्रश्न-पुस्तिका पर नहीं। सभी प्रश्नों के अंक समान हैं।
3. प्रश्नों के उत्तर अंकित करने से पूर्व प्रश्न-पुस्तिका तथा OMR आन्सर-शीट को सावधानीपूर्वक देख लें। दोषपूर्ण प्रश्न-पुस्तिका जिसमें कुछ भाग छपने से छूट गए हों या प्रश्न एक से अधिक बार छप गए हों या उसमें किसी अन्य प्रकार की कमी हो, उसे तुरन्त बदल लें।
4. प्रश्न-पुस्तिका में प्रत्येक प्रश्न के चार सम्भावित उत्तर- A, B, C एवं D हैं। परीक्षार्थी को उन चारों विकल्पों में से सही उत्तर छाँटना है। उत्तर को OMR उत्तर-पत्रक में सम्बन्धित प्रश्न संख्या में निम्न प्रकार भरना है :

(शेष निर्देश अन्तिम पृष्ठ पर)

1. Saddle point occurs when :

(A) Maximin = Minimax

(B) Maximin $\neq$ Minimax

(C) No strategy

(D) Mixed strategy

2. Pure strategy means :

(A) Random choice

(B) Fixed strategy

(C) Mixed strategy

(D) No strategy

3. Mixed strategy involves :

(A) Single action

(B) Probability distribution over strategies

(C) Deterministic choice

(D) No choice

4. Rule of dominance helps to :

(A) Increase matrix size

(B) Eliminate dominated strategies

(C) Add strategies

(D) Multiply payoff

5. Game without saddle point requires :

(A) Pure strategy

(B) Mixed strategy

(C) No strategy

(D) Deterministic solution

6. Value of game indicates :

(A) Strategy count

(B) Expected gain or loss

(C) Constraints

(D) Matrix size

7. Decision tree consists of :

(A) Nodes and Branches

(B) Matrices only

(C) Variables only

(D) Equations only

8. Game theory mainly deals with :

(A) Cooperation only

(B) Competitive situations

(C) Transportation

(D) Assignment

9. Feasible region in LPP is :

(A) Infeasible area

(B) Intersection of constraints

(C) Outside area

(D) None of the above

10. Optimal solution lies at :

(A) Any point

(B) Corner point

(C) Midpoint

(D) Origin

11. Economic interpretation of simplex solution gives :

(A) Shadow prices

(B) Political values

(C) Personal values

(D) Random values

12. An infeasible solution occurs when :

(A) Constraints are satisfied

(B) No common feasible region exists

(C) Objective function is maximized

(D) Solution is optimal

13. An unbounded solution means :

(A) No feasible region

(B) Objective function increases indefinitely

(C) Unique solution

(D) Multiple solution

14. Artificial variables are introduced in :

(A) Graphical method

(B) Big M method

(C) MODI method

(D) Assignment method

15. Degeneracy in LPP occurs when :

(A) More basic variables than constraints

(B) A basic variable takes zero value

(C) No feasible solution

(D) Infinite solution

16. In maximization problem, optimality is reached when :

(A) All $Cj - Zj \geq 0$

(B) All $Cj - Zj \leq 0$

(C) All values positive

(D) All values negative

17. The corner point theorem states that :

(A) Optimal solution lies outside region

(B) Optimal solution lies at extreme point

(C) No solution exists

(D) Infinite solutions

18. Linear Programming is widely used in :

(A) Production planning

(B) Superstition

(C) Political science

(D) Music

19. Transportation model aims to :

(A) Maximize distance

(B) Minimize transportation cost

(C) Increase supply

(D) Increase demand

20. Balanced transportation problem means :

(A) Supply = Demand

(B) Supply > Demand

(C) Demand > Supply

(D) None of the above

21. North-West Corner method gives :

(A) Optimal solution

(B) Initial feasible solution

(C) Infeasible solution

(D) No solution

22. Vogel's Approximation Method (VAM) gives:

(A) Poor solution

(B) Better initial solution

(C) No solution

(D) Random solution

23. MODI method is used for :

(A) Initial solution

(B) Optimality test

(C) Graphical solution

(D) Assignment

24. Stepping stone method is used for :

(A) Feasibility

(B) Optimality testing

(C) Modeling

(D) None of the above

25. Assignment problem is special case of :

(A) LPP

(B) Transportation problem

(C) Game theory

(D) Decision theory

26. Hungarian method is used for :

(A) Transportation

(B) Assignment

(C) LPP

(D) Inventory

27. Objective function represents :

(A) Constraints

(B) Goal to maximize or minimize

(C) Decision variables

(D) Slack variables

28. Constraints represent :

(A) Goals

(B) Limitations

(C) Profits

(D) Costs

29. OR Methodology ends with :

(A) Model formulation

(B) Implementation

(C) Problem identification

(D) Data collection

30. OR techniques are mainly quantitative in nature :

(A) True

(B) False

(C) Partially

(D) None of the above

31. The systems approach in Operations Research means :

(A) Studying each part separately

(B) Studying the organization as a whole system

(C) Ignoring interrelationships

(D) Focusing only on profits

32. Which of the following is a phase of Operations Research?

(A) Gossiping

(B) Model validation

(C) Advertising

(D) Recruitment

33. A model that uses physical representation is called :

(A) Symbolic model

(B) Mathematical model

(C) Iconic model

(D) Probabilistic model

34. Which of the following is a commercial application of OR?

(A) Inventory control

(B) Astrology prediction

(C) Political campaign

(D) Weather forecasting

35. Mixed strategy is used when :

(A) Saddle point exists

(B) No saddle point

(C) Deterministic

(D) Balanced

36. Maximin criterion is used in :

(A) Certainty

(B) Risk

(C) Uncertainty

(D) Deterministic case

37. Minimax regret criterion is also called :

(A) Laplace criterion

(B) Savage criterion

(C) Hurwicz criterion

(D) Wald criterion

38. Laplace criterion assumes :

(A) Equal probabilities

(B) Known probabilities

(C) No probabilities

(D) Maximum regret

39. Hurwicz criterion combines :

(A) Optimism and Pessimism

(B) Risk and Certainty

(C) Cost and Demand

(D) Profit and Loss

40. Expected Monetary Value (EMV) is used in :

(A) Certainty

(B) Risk

(C) Uncertainty

(D) None of the above

41. Payoff matrix shows :

(A) Costs only

(B) Gains or losses for strategies

(C) Constraints

(D) Variables

42. In two-person zero sum game :

(A) Total payoff constant

(B) Total payoff variable

(C) Both win

(D) Both lose

43. In assignment problem, number of jobs must equal :

(A) Workers

(B) Machines

(C) Tasks

(D) All of the above

44. If total supply exceeds total demand, the problem is :

(A) Balanced

(B) Unbalanced

(C) Optimal

(D) Degenerate

45. To balance an unbalanced TP, we add :

(A) Extra constraint

(B) Dummy row or column

(C) Artificial variable

(D) Slack variable

46. Degeneracy in TP occurs when allocations are less than :

(A) $m + n - 1$

(B) $m \times n$

(C) $m - n$

(D) $n - m$

47. Opportunity cost in MODI method is represented by :

(A) Cij

(B) Δ ij

(C) Ui

(D) Vj

48. Optimal solution in TP exists when :

(A) All $\Delta ij \geq 0$ (minimization)

(B) Some Δ ij negative

(C) All allocations zero

(D) None of the above

49. In profit maximization TP, we convert it into :

(A) Cost minimization problem

(B) Assignment problem

(C) Game theory

(D) Decision tree

50. Assignment problem matrix is :

(A) Rectangular

(B) Square

(C) Triangular

(D) Circular

51. Assignment problem minimizes :

(A) Profit

(B) Cost or time

(C) Demand

(D) Supply

52. Decision theory deals with :

(A) Optimization under uncertainty

(B) Deterministic models

(C) Transport models

(D) Assignment

53. Decision under certainty means :

(A) Known outcomes

(B) Unknown outcomes

(C) Random events

(D) Risk

54. Decision under risk involves :

(A) No probabilities

(B) Known probabilities

(C) No data

(D) Guess

55. Decision under uncertainty means :

(A) Known probabilities

(B) Unknown probabilities

(C) Fixed outcome

(D) None of the above

56. Decision tree helps in :

(A) Graphical analysis of decisions

(B) Transportation

(C) Assignment

(D) LPP

57. Game theory studies :

(A) Competition between players

(B) Cooperation

(C) Random events

(D) Inventory

58. Two-person zero sum game means :

(A) Both gain

(B) One's gain = other's loss

(C) Both lose

(D) None of the above

59. Saddle point indicates :

(A) Pure strategy solution

(B) Mixed strategy

(C) No solution

(D) None of the above

60. Rule of dominance is applied to :

(A) Eliminate inferior strategies

(B) Add strategies

(C) Multiply payoff

(D) None of the above

61. Operations Research originated during :

(A) World War I

(B) World War II

(C) Industrial Revolution

(D) Cold War

62. Operations Research was first applied in :

(A) Agriculture

(B) Military Operations

(C) Banking

(D) Education

63. The term 'Operations Research' was first used in :

(A) USA

(B) Germany

(C) UK

(D) India

64. Operations Research is mainly concerned with :

(A) Intuition-based decisions

(B) Scientific decision-making

(C) Political decisions

(D) Emotional judgments

65. The nature of OR is :

(A) Artistic

(B) Scientific and Quantitative

(C) Religious

(D) Historical

66. Which is not a feature of OR?

(A) Systems approach

(B) Team work

(C) Guesswork

(D) Mathematical modeling

67. The first phase of OR Methodology is :

(A) Solution

(B) Model construction

(C) Problem definition

(D) Implementation

68. Model in OR refers to :

(A) Physical object

(B) Simplified representation of reality

(C) Human model

(D) Machine

69. Sensitivity analysis in OR helps to :

(A) Ignore changes

(B) Study effect of parameter changes

(C) Increase cost

(D) Eliminate constraints

70. LPP stands for :

(A) Linear Programming Problem

(B) Logical Planning Process

(C) Linear Process Plan

(D) None of the above

71. LPP deals with optimization of :

(A) Single objective

(B) Multiple unrelated objectives

(C) No objective

(D) Random objective

72. Graphical method is applicable when variables are :

(A) Two

(B) Three

(C) Four

(D) Five

73. Standard form of LPP requires :

(A) $\leq$ constraints

(B) $\geq$ constraints

(C) Equality constraints

(D) No constraints

74. Simplex method is used when variables are :

(A) Two only

(B) More than two

(C) One

(D) None of the above

75. Slack variable is added to :

(A) $\geq$ constraint

(B) $\leq$ constraint

(C) Objective

(D) None of the above

76. Surplus variable is subtracted from :

(A) $\geq$ constraint

(B) $\leq$ constraint

(C) Objective

(D) None of the above

77. In minimization problem, optimality is reached when :

(A) All $Cj - Zj \geq 0$

(B) All $Cj - Zj \leq 0$

(C) All values zero

(D) None of the above

78. The feasible region in graphical method is :

(A) Shaded area satisfying constraints

(B) Entire graph

(C) Outside area

(D) Origin only

79. Linear Programming assumes :

(A) Non-linearity

(B) Certainty and Proportionality

(C) Randomness

(D) Circularity

80. The objective function in LPP must be :

(A) Linear

(B) Quadratic

(C) Exponential

(D) Logarithmic

81. A redundant constraint is one which :

(A) Affects solution

(B) Does not affect feasible region

(C) Makes solution infeasible

(D) Maximizes profit

82. Dual of LPP provides information about :

(A) Slack variables

(B) Shadow prices

(C) Transportation cost

(D) Assignment

83. Shadow price represents :

(A) Market value

(B) Marginal value of resource

(C) Total cost

(D) Fixed cost

84. Big M method is used when :

(A) Only $\leq$ constraints exist

(B) Artificial variables are required

(C) Graphical solution is applied

(D) No constraints exist

85. Mathematical models are also known as :

(A) Iconic models

(B) Symbolic models

(C) Physical models

(D) Static models

86. Iconic models are :

(A) Mathematical

(B) Physical replicas

(C) Verbal models

(D) Graphical

87. Deterministic models assume :

(A) Uncertainty

(B) Risk

(C) Certainty

(D) Probability

88. Probabilistic models deal with :

(A) Certainty

(B) Risk and Uncertainty

(C) Fixed values

(D) Static conditions

89. OR techniques include :

(A) Linear programming

(B) Astrology

(C) Politics

(D) Guessing

90. Scope of OR in business includes :

(A) Production planning

(B) Astrology

(C) Superstition

(D) Fashion

91. OR uses interdisciplinary approach involving :

(A) Only managers

(B) Team of experts

(C) Only accountants

(D) Politicians

92. Feasible solution means :

(A) Violates constraints

(B) Satisfies all constraints

(C) Ignores objective

(D) No solution

93. Hungarian method is also called :

(A) Matrix reduction method

(B) Graphical method

(C) Big M method

(D) MODI method

94. Multiple optimal solutions in assignment occur when :

(A) More than one zero opportunity cost

(B) Only one zero

(C) No zero

(D) All values positive

95. If jobs exceed workers, we add :

(A) Slack

(B) Dummy worker

(C) Artificial variable

(D) Surplus

96. Transportation model is used mainly for :

(A) Scheduling

(B) Allocation of goods

(C) Strategy making

(D) Forecasting

97. Initial feasible solution does not guarantee :

(A) Feasibility

(B) Optimality

(C) Allocation

(D) Balance

98. VAM is preferred because it :

(A) Gives poor solution

(B) Provides near optimal initial solution

(C) Is simplest

(D) Avoids allocation

99. MODI method is also known as :

(A) U-V method

(B) North-West method

(C) Graphical method

(D) Big M method

100. Stepping stone method evaluates :

(A) Basic cells

(B) Empty cells

(C) All cells

(D) None of the above

Rough Work

Example :

Question :

Q.1 Ⓐ ● Ⓒ Ⓓ

Q.2 Ⓐ Ⓑ ● Ⓓ

Q.3 Ⓐ ● Ⓒ Ⓓ

5. Each question carries equal marks. Marks will be awarded according to the number of correct answers you have.

6. All answers are to be given on OMR Answer Sheet only. Answers given anywhere other than the place specified in the answer sheet will not be considered valid.

7. Before writing anything on the OMR Answer Sheet, all the instructions given in it should be read carefully.

8. After the completion of the examination, candidates should leave the examination hall only after providing their OMR Answer Sheet to the invigilator. Candidate can carry their Question Booklet.

9. There will be no negative marking.

10. Rough work, if any, should be done on the blank pages provided for the purpose in the booklet.

11. To bring and use of log-book, calculator, pager & cellular phone in examination hall is prohibited.

12. In case of any difference found in English and Hindi version of the question, the English version of the question will be held authentic.

Impt. On opening the question booklet, first check that all the pages of the question booklet are printed properly. If there is any discrepancy in the question Booklet, then after showing it to the invigilator, get another question Booklet of the same series.

उदाहरण :

प्रश्न :

प्रश्न 1 Ⓐ ● Ⓒ Ⓓ

प्रश्न 2 Ⓐ Ⓑ ● Ⓓ

प्रश्न 3 Ⓐ ● Ⓒ Ⓓ

5. प्रत्येक प्रश्न के अंक समान हैं। आपके जितने उत्तर सही होंगे, उन्हीं के अनुसार अंक प्रदान किये जायेंगे।

6. सभी उत्तर केवल ओ०एम०आर० उत्तर-पत्रक (OMR Answer Sheet) पर ही दिये जाने हैं। उत्तर-पत्रक में निर्धारित स्थान के अलावा अन्यत्र कहीं पर दिया गया उत्तर मान्य नहीं होगा।

7. ओ०एम०आर० उत्तर-पत्रक (OMR Answer Sheet) पर कुछ भी लिखने से पूर्व उसमें दिये गये सभी अनुदेशों को सावधानीपूर्वक पढ़ लिया जाये।

8. परीक्षा समाप्ति के उपरान्त परीक्षार्थी कक्ष निरीक्षक को अपनी OMR Answer Sheet उपलब्ध कराने के बाद ही परीक्षा कक्ष से प्रस्थान करें। परीक्षार्थी अपने साथ प्रश्न-पुस्तिका ले जा सकते हैं।

9. निगेटिव मार्किंग नहीं है।

10. कोई भी रफ कार्य, प्रश्न-पुस्तिका में, रफ-कार्य के लिए दिए खाली पेज पर ही किया जाना चाहिए।

11. परीक्षा-कक्ष में लॉग-बुक, कैल्कुलेटर, पेजर तथा सेल्युलर फोन ले जाना तथा उसका उपयोग करना वर्जित है।

12. प्रश्न के हिन्दी एवं अंग्रेजी रूपान्तरण में भिन्नता होने की दशा में प्रश्न का अंग्रेजी रूपान्तरण ही मान्य होगा।

महत्वपूर्णः प्रश्नपुस्तिका खोलने पर प्रथमतः जाँच कर देख लें कि प्रश्नपुस्तिका के सभी पृष्ठ भलीभाँति छपे हुए हैं। यदि प्रश्नपुस्तिका में कोई कमी हो, तो कक्षनिरीक्षक को दिखाकर उसी सिरीज की दूसरी प्रश्नपुस्तिका प्राप्त कर लें।