

**22U668**

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Name : .....

Reg No. : .....

**SIXTH SEMESTER B.B.A. DEGREE EXAMINATION, APRIL 2025**

(CBCSS-UG)

(Regular/Supplementary/Improvement)

**CC19U BBA6 B13 - MANAGEMENT SCIENCE**

(BBA - Core Course)

(2019 Admission onwards)

Time: 2.5 Hours

Maximum: 80 Marks

Credit: 4

**Part A** (Short answer questions)

Answer ***all*** questions. Each question carries 2 marks.

1. Give the objectives of OR.
2. Give any point explaining the relation between OR and Modern Business management.
3. Define Linear programming.
4. State the meaning of objective function.
5. Explain unbounded solution under L.P.P.
6. Provide any 2 disadvantages of L.P.P.
7. Mention any 4 objectives of network analysis.
8. Classify the types of activities.
9. What do you mean by decision theory?
10. What is opportunity loss?
11. What do you mean by Game theory?
12. Illustrate transportation problem in the form of LPP.
13. Discuss basic feasible solution under transportation problem.
14. What is Lowest Cost Entry Method?
15. Write a note on Vogel's Approximation Method.

**(Ceiling: 25 Marks)**

**Part B** (Paragraph questions)

Answer ***all*** questions. Each question carries 5 marks.

16. What is the nature of OR?

17. What are the types of models commonly used in OR?
18. Briefly explain the managerial applications of network techniques.
19. Construct the network diagram.
  - (i) A is the first operation
  - (ii) B and C can be performed in parallel and are immediate successor to A
  - (iii) D, E and F follow B
  - (iv) G follows E.
  - (v) H follows D, but it cannot start until E is complete
  - (vi) I and J succeed G
  - (vii) J precede K.
  - (viii) H and I precede L.
  - (ix) M succeeds Land K.
  - (x) The last operation N succeeds M and C.
20. Explain the advantages and disadvantages of network techniques.
21. A management is faced with the problem of choosing one of the products for manufacturing. The probability matrix after market research for the two products was as follows.

State of nature

| Act         | Profit (in Rs.) if market is |      |      |
|-------------|------------------------------|------|------|
|             | Good                         | Fair | Poor |
| Product 'A' | 0.75                         | 0.15 | 0.10 |
| Product 'B' | 0.60                         | 0.30 | 0.10 |

The profit that the management can make for different levels of market acceptability of the products are as follows.

| Act         | State of nature              |       |              |
|-------------|------------------------------|-------|--------------|
|             | Profit (in Rs.) if market is |       |              |
|             | Good                         | Fair  | Bad          |
| Product 'A' | 35000                        | 15000 | 5000         |
| Product 'B' | 50000                        | 20000 | Loss of 3000 |

Calculate expected value of the choice of alternatives and advise the management.

22. Find the initial feasible solution to the transportation problem given below, by north west corner rule.

| Origins        | Destination    |                |                | Supply |
|----------------|----------------|----------------|----------------|--------|
|                | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> |        |
| O <sub>1</sub> | 2              | 7              | 4              | 5      |
| O <sub>2</sub> | 3              | 3              | 1              | 8      |
| O <sub>3</sub> | 5              | 4              | 7              | 7      |
| O <sub>4</sub> | 1              | 6              | 2              | 14     |
| Demand         | 7              | 9              | 18             |        |

23. Determine the optimal transportation plan from the following table giving the plant to market shipping costs and quantities required at each market and available at each plant:

| Plant          | Market         |                |                |                | Availability |
|----------------|----------------|----------------|----------------|----------------|--------------|
|                | W <sub>1</sub> | W <sub>2</sub> | W <sub>3</sub> | W <sub>4</sub> |              |
| F <sub>1</sub> | 11             | 20             | 7              | 8              | 50           |
| F <sub>2</sub> | 21             | 16             | 10             | 12             | 40           |
| F <sub>3</sub> | 8              | 12             | 18             | 9              | 70           |
| Requirement    | 30             | 25             | 35             | 40             |              |

(Ceiling: 35 Marks)

**Part C (Essay questions)**

Answer any *two* questions. Each question carries 10 marks.

24. The following table gives the activities in a construction project and other relevant information.

|            |     |     |     |     |     |     |
|------------|-----|-----|-----|-----|-----|-----|
| Activity : | 1-2 | 1-3 | 2-3 | 2-4 | 3-4 | 4-5 |
| Duration : | 20  | 25  | 10  | 12  | 6   | 10  |

- (1) Draw the network for the project. (2) Find free, total and independent floats for each activity.  
(3) Which are the critical activities?

25. Discuss Program Evaluation and Review Technique.

26. Given the following pay off matrix:

| State of Nature | Probability | Decision      |                  |                  |
|-----------------|-------------|---------------|------------------|------------------|
|                 |             | Do Not expand | Expand 200 units | Expand 400 units |
| High demand     | .4          | 2500          | 3500             | 5000             |
| Medium demand   | .4          | 2500          | 3500             | 2500             |
| Low demand      | .2          | 2500          | 1500             | 1000             |

What should be the decision if we use?

- (i) EMV criterion (ii) The minimax criterion (iii) The maximax criterion.

27. Given below is a payoff table.

| Events | Act |    |     |
|--------|-----|----|-----|
|        | A1  | A2 | A3  |
| E1     | 5   | -1 | -17 |
| E2     | 18  | 28 | 30  |
| E3     | 25  | 50 | 80  |

What will be the optimal decision if the criterion followed is

- (i) Maximax (ii) Minimax (iii) Maximin (iv) Laplace (v) EMV (vi) EOL

Given probabilities for various events are 3...4,.3 respectively.

(2 × 10 = 20 Marks)

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