

**B.B.A. Semester - 5 (Remedial) (CBCS) Examination****March/April-2026 (NEW COURSE)****Statistics Group - Fundamentals of Operations Research(Elective)****Time: 2:30 Hours****Marks:70****Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate marks.

- Que.1 (A) Explain role of Operations Research in business. (07)  
 (B) Give limitations of O.R. (07)

OR

- Que.1 What is Operations research? Explain with merits and limitations. (14)  
 Que.2 A production manager wants to determine the quantity to be produce per month of products A and B manufactured by his firm. This data on resources required, availability of resources, and the contribution from sale of each product are given in the following table. (14)

|                              | Requirements |           | Capacity available per month |
|------------------------------|--------------|-----------|------------------------------|
|                              | Product A    | Product B |                              |
| Raw material (kg)            | 60           | 120       | 12,000                       |
| Machining (hours per Pieces) | 8            | 5         | 600                          |
| Assembly (man)               | 3            | 4         | 500                          |

The Contribution per pieces of product A Is Rs.30 and that of product B is Rs. 40.The objective of the production manager is to maximize contribution. Solve the problem graphically.

OR

- Que.2 (A) Explain advantage and drawback of L.P.P. (07)  
 (B) Explain graphic Method (07)  
 Que.3 Solve the problem by Simplex Method. (14)  
 $Z_{\text{Max}} = 2x_1 + 5x_2$   
 Subject to constraint  
 $x_1 + 4x_2 \leq 24, \quad 3x_1 + x_2 \leq 21$   
 $x_1 + x_2 \leq 9, \quad x_1, x_2 \geq 0$

OR

- Que.3 (A) Explain Simplex method. (07)  
 (B) Write characteristics of linear programming problem. (07)  
 Que.4 Find the optimal solution of the following transportation problem. (14)

|                | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | Supply |
|----------------|----------------|----------------|----------------|----------------|----------------|--------|
| O <sub>1</sub> | 20             | 10             | 15             | 20             | 19             | 40     |
| O <sub>2</sub> | 5              | 8              | 12             | 5              | 7              | 30     |
| O <sub>3</sub> | 6              | 15             | 10             | 7              | 10             | 50     |
| O <sub>4</sub> | 8              | 12             | 11             | 8              | 14             | 70     |
| Demand         | 40             | 60             | 20             | 40             | 60             |        |

OR

- Que.4 (A) What is transportation problem? What do you understand by it? (07)  
 (B) Explain Matrix Minima method for solve a transportation problem. (07)

- Que.5 (A) Give difference between Transportation problem and Assignment problem. (07)  
(B) Explain Hungarian Method. (07)

OR

- Que.5 Solve the following Assignment Problem. (14)

|   | I | II | III | IV | V |
|---|---|----|-----|----|---|
| A | - | 4  | 2   | -  | 1 |
| B | 1 | 1  | 5   | 1  | 2 |
| C | 2 | -  | 1   | 4  | - |
| D | 3 | 2  | 3   | 3  | 3 |
| E | - | 3  | 4   | 2  | - |

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