**647510** **BBA5Sg0E507D** **Seat No :_____**

# B.B.A. Semester - 5 (*CBCS*) Examination

## Oct/Nov - 2022 (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.

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Q-1(A) Explain role of Operations Research in business. (07)

Q-1(B) Give limitations of O.R. (07)

OR

Q-1(A) Write 3 important definitions of O.R. (07)

Q-1(B) What are the essential features of O.R. approach? (07)

Q-2 Solve the following transportation problem using (14)

(1) North-West Corner rule method

(2) Vogel's Approximation Method and check the answer by both the method. Is it same?

| Factory/warehouse | $W_1$ | $W_2$ | $W_3$ | $W_4$ | Capacity |
|---|---|---|---|---|---|
| $F_1$ | 21 | 16 | 25 | 13 | 11 |
| $F_2$ | 17 | 18 | 14 | 23 | 13 |
| $F_3$ | 32 | 27 | 18 | 41 | 19 |
| Requirement | 6 | 10 | 12 | 15 | |

OR

Q-2(A) What is transportation problem? What do you understand by it? (07)

Q-2(B) Explain Matrix Minima method for solve a transportation problem. (07)

Q-3 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 | - |

OR

Q-3(A) Give difference between Transportation problem and Assignment problem. (07)

Q-3(B) Explain Hungarian Method. (07)

Q-4 Solve the problem by Simplex Method. (14)

Max $Z = 2X_1 + 5X_2$

Subject to constraint

$X_1 + 4X_2 \leq 24$, $3X_1 + X_2 \leq 21$

$X_1 + X_2 \leq 9$, $X_1, X_2 \geq 0$

OR

Q-4(A) What is linear programming problem? (07)

Q-4(B) Write characteristics of linear programming problem. (07)

Q-5 Solve the following linear programming problem graphically. (14)

Maximum $Z = 80X_1 + 120X_2$

Subject to constraints

$X_1 + X_2 \leq 9$, $X_1 \geq 2$, $X_2 \geq 3$, $20X_1 + 50X_2 \leq 360$, $X_1, X_2 \geq 0$.

OR

Q-5(A) Explain graphic method. (07)

Q-5(B) Give difference between Simplex Method and Graphic Method (07)

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