

B.B.A. Semester - 5 (Remedial) (CBCS) Examination**March/April-2023 (Old Course)****STATISTICS GROUP: FUNDAMENTALS OF OPERATION RESEARCH (ELECTIVE)****Time: 2:30 Hours****Marks: 70****Instructions:**

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

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 linear programming problem graphically. (14)

$$\text{Maximum } Z = 80X_1 + 120X_2$$

Subject to constraints

$$X_1 + X_2 \leq 9, \quad X_1 \geq 2, \quad X_2 \geq 3,$$

$$20X_1 + 50X_2 \leq 360, \quad X_1, X_2 \geq 0$$

OR**Q-2 (A)** Explain graphic method. (07)**Q-2 (B)** Give difference between Simplex Method and Graphic Method (07)**Q-3** Solve the problem by Simplex Method. (14)

$$\text{Max } Z = 2X_1 + 5X_2$$

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**Q-3 (A)** What is linear programming problem? (07)**Q-3 (B)** Write characteristics of linear programming problem. (07)**Q-4** Solve the following transportation problem using (1) North-West Corner rule method (14)

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

Factory/warehouse	W1	W2	W3	W4	Capacity
F1	21	16	25	13	11
F2	17	18	14	23	13
F3	32	27	18	41	19
Requirement	6	10	12	15	

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

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