

B.B.A. Semester - 5 (Remedial) (CBCS) Examination**March/April-2024 (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 O.R. in Business. (07)
 (B) Explain characteristics of O.R. (07)

OR

- Que.1 What is Operations research? Explain with merits and limitations. (14)

- Que.2 What is Transportation problem? (14)

OR

- Que.2 Find optimum solution of given transportation problem. (14)

Plant	W_1	W_2	W_3	W_4	W_5	Avalibility
P_1	20	28	32	55	70	50
P_2	48	36	40	44	25	100
P_3	35	55	22	45	48	150
Requirement	100	70	50	40	40	300/300

- Que.3 What is Assignment Problem? Explain Hungarian method. (14)

OR

- Que.3 Solve the following unbalance Assignment problem of minimizing total time for doing all jobs. (14)

Operator	job				
	J_1	J_2	J_3	J_4	J_5
O_1	6	2	5	3	6
O_2	2	5	8	7	7
O_3	7	8	6	9	8
O_4	6	2	3	4	5
O_5	9	3	8	9	7
O_6	4	7	4	6	8

- Que.4 Explain purpose and procedures of Simplex method. (14)

OR

- Que.4 Solve the following Liner programming problem by Simplex Method. (14)

$$\text{Maximum } Z = 3x_1 + 4x_2$$

Subject to constraint

$$2x_1 + 3x_2 \leq 6$$

$$x_1 + 2x_2 \leq 20$$

$$x_1, x_2 \geq 0$$

- Que.5 What is linear programming problem? (14)

OR

- Que.5 XYZ farm is engaged in breeding pigs. The pigs are fed on various products grown on the farm. Because of the need to ensure certain nutrient constituents, it is necessary to buy additional one or two products, which we shall call A and B. The nutrient constituents (vitamins and proteins) in each unit of the product are given below. (14)

Nutrient constituents	Nutrient constituents		Minimum requirement of Nutrient constituents
	A	B	
1	36	6	108
2	3	12	36
3	20	10	100
