B.Com. (BIM) Degree Examinations - Even Semester 2021

I Year II Semester

Elements of Operations Research

Max Marks: 25

Answer any **Five** questions   (5 * 5 = 25)

1. What are the techniques of Operations Research?

2. State any four applications of Operations Research.

3. Solve the following LPP, using Simplex method.

$$\text{Max } z = 5x_1 + 3x_2$$

Subject to $3x_1 + 5x_2 \leq 15$

$$5x_1 + 2x_2 \leq 10$$

$$x_1, x_2 \geq 0$$

4. Solve the following transportation problem using Vogel's method in order to minimize total transportation cost

		Destinations					
		D1	**D2**	**D3**	**D4**	**D5**	**Availabilities**
Origin	**O1**	3	5	8	8	11	**20**
	O2	5	4	10	7	10	**40**
	O3	2	5	8	7	5	**30**
	Requirements	10	15	25	30	40	

5. Following is the payoff matrix for player A

		Player B				
		B1	**B2**	**B3**	**B4**	**B5**
Player A	**A1**	2	4	3	8	4
	A2	5	6	3	7	8
	A3	6	7	9	8	7
	A4	4	2	8	4	2

Using dominance property, obtain the optimum strategies for both the players and determine the value of the game.

6. A company faced with 2 the problem of assigning 6 different machines and 5 different jobs. The cost of estimated as follows (Rs.100). Solve the problem assuming that the object is minimize the total cost.

		Jobs				
		1	2	3	4	5
	1	2.5	5	1	6	1
	2	2	5	1.5	7	3
Machines	3	3	6.5	2	8	3
	4	3.5	6.5	2	9	4.5
	5	3.5	7	3	9	6
	6	6	9	5	10	6

7. Solve the following LPP by Graphical method.

$$\text{Min } Z = 3X_1 + 2X_2$$

$$5x_1 + x_2 \geq 10$$

$$\text{Subject to } x_1 + x_2 \geq 6$$

$$X_1 + 4x_2 \geq 12$$

$$X_1 + x_2 \geq 0$$