Regd.No:_____

(STA N – 5306A1)

B.SC Degree (CBCS) Examinations- – 3 MAR 2023

SEMESTER-V (REGULAR)

OPERATION RESEARCH - 1

TIME: 3 Hrs Max Marks:60

SECTION – A

Answer any **FIVE** of the following, each question carries equal marks. **5 X 4 = 20M**

1. Explain the applications of OR.
2. Explain the mathematical formulation of LPP.
3. Define canonical form of LPP.
4. Define Slack and Surplus variables.
5. What is the degeneracy in LPP? How to resolve it.
6. Explain Big – M method to solve the given LPP.
7. Write the advantages of Dual simplex method.
8. Prove that Dual of Dual is Primal.
9. Define two – person zero – sum games.
10. Define Optimum strategy and saddle point.

SECTION – B

Answer the following Questions **5 X 8 = 40M**

11. Explain meaning, features and scope of OR.

(OR)

12. Solve the following LPP by using graphical method.

$$Max\ Z = 3X + 2Y$$

Subject to

$$X - Y \leq 1$$

$$X + Y \geq 3$$

$$X\ and\ Y \geq 0$$

P.T.O

13. Describe the Simplex Algorithm.

(OR)

14. Solve the following LPP by Simplex method

$$Maximize\ Z = X_1 + X_2 + 3X_3$$

$$Subject\ to$$

$$3X_1 + 2X_2 + X_3 \leq 3$$

$$2X_1 + X_2 + 2X_3 \leq 2$$

$$and \quad X_1, X_2, X_3 \geq 0$$

15. Explain the procedure for two – phase simplex method to solve the given LPP.

(OR)

16. Solve the following LPP by using Big – M method

$$Minimize\ Z = 15X_1 + 3X_2$$

$$Subject\ to$$

$$3X_1 - X_2 - X_3 \geq 3$$

$$X_1 - X_2 + X_3 \geq 2$$

$$and\ X_1, X_2, X_3 \geq 0$$

17. Explain the computational procedure of Dual Simplex method.

(OR)

18. Solve the following LPP by Dual Simplex method

$$Maximize\ Z = -2x_1 - x_3$$

$$subject\ to$$

$$x_1 + x_2 - x_3 \geq 5$$

$$x_1 - 2x_2 + 4x_3 \geq 8$$

$$and\ x_1, x_2, x_3 \geq 0$$

19. Explain the dominance property.

(OR)

20. Solve the following game.

Player – A	Player - B		
		B_1	B_2
	A_1	2	- 5
	A_2	- 3	6

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