

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION MO/2024)

CLASS: BBA
BRANCH: BBA

SEMESTER: IV
SESSION : MO/2024

SUBJECT: MT210 FUNDAMENTALS OF OPERATIONS RESEARCH
TIME: 02 Hours

FULL MARKS: 25

INSTRUCTIONS:

1. The question paper contains 5 questions each of 5 marks and total 25 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. **NO TABLE** will be supplied to the candidates

		CO	BL
Q.1(a)	Operations Research has been defined in various ways but you are required to define the subject appropriately.	[2]	2 2
Q.1(b)	What is meant by a management model of a real situation? Discuss uses and limitations of Operations Research.	[3]	1 3
Q.2(a)	Write mathematical formulation of LPP Model.	[2]	2 2
Q.2(b)	A paper mills produces two grades of paper namely X&Y. Owning to raw material restrictions, it cannot produce more than 400 tons of grade X and 300 tons of grade Y in a week. There are 160 production hours in week. It requires 0.2 and 0.4 hours to produce a ton of products X and Y, respectively with corresponding profits of ₹ 200 and ₹ 500 per ton. Formulate the above as an LPP to maximize profit and find the optimal product mix.	[3]	3 4
Q.3(a)	Steps to be followed for solving LPP by graphical method. Discuss.	[2]	2 2
Q.3(b)	$Z \text{ max} = 8X + 5Y$ Subject to constraints $2X + Y \leq 500, X \leq 500, Y \leq 250, X, Y \geq 0$. Solve graphically to get optimal solution.	[3]	2 3
Q.4(a)	Solve graphically the following LPP $\text{Max } Z = 3X - 2Y$ Subject to constraints $-2x + 3y \leq 9, x - 5y \geq -20, x, y \geq 0$.	[2]	3 2
Q.4(b)	Classification of models is a subjective problem. So classify models by function and structure.	[3]	2 2
Q.5(a)	Steps to be followed while solving Simplex Method.	[2]	2 2
Q.5(b)	Use simplex method to get optimal values of decision variables Maximum of $Z = 6X + 8Y$ Subject to, $5X + 2Y \leq 20, X + 2Y \leq 10, X, Y \geq 0$.	[3]	3 4