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

CLASS: BCA **SEMESTER : IV**
BRANCH: BCA **SESSION : SP/2024**

SUBJECT: CA265 FUNDAMENTAL OF OPTIMIZATION TECHNIQUES

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*. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates**

			CO	BL
Q.1(a)	Define the term Optimization.	[2]	1	2
Q.1(b)	Explain phases and processes of an OR study and their importance in solving problems.	[3]	2	1
Q.2(a)	List the different approaches of Operation Research.	[2]	2	2
Q.2(b)	Explain briefly the different types of models used in operation research.	[3]	2	1
Q.3(a)	Define the terms: (i) Feasible Solution (ii) Unbounded Solution	[2]	3	1
Q.3(b)	A company manufactures two products A and B. These products are processed in the same machine. It takes 10 minutes to process one unit of product A and 2 minutes for each unit of product B and the machine operates for a maximum of 35 hours in a week. Product A required 1 kg and product B requires 0.5 kg of raw materials per unit, the supply of which is 600 kg per week. Market constraints on product B is known to be minimum of 800 units every week. Product A costs Rs. 5 per unit and sold at Rs 10. Product B costs Rs 6 per unit and can be sold in the market at a unit price of Rs 8. Formulate the problem as an LPP to maximize the profit.	[3]	1	4
Q.4	Solve the following LPP by graphical method. $Minimize \quad Z = 20x_1 + 10x_2$ $Subject\ to, \ x_1 + 2x_2 \leq 40$ $3x_1 + x_2 \geq 30$ $4x_1 + 3x_2 \geq 60$ $and, \quad x_1, x_2 \geq 0$	[5]	5	4,5
Q.5	Solve the following LPP by Simplex method. $Maximize \quad Z = 3x_1 + 2x_2$ $Subject\ to, \ 4x_1 + 3x_2 \leq 12$ $4x_1 + x_2 \leq 8$ $4x_1 - x_2 \leq 8$ $and, \quad x_1, x_2 \geq 0$	[5]	5	4,5

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