BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: MTECH **SEMESTER : II**
BRANCH: CSE **SESSION : SP/2024**

SUBJECT: CS630 MODERN OPTIMIZATION TECHNIQUES

TIME: 3 Hours **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

			CO	BL
Q.1(a)	Discuss the algorithm followed for the simplex method. Also explain the situation where artificial variable is used showing an example case.	[5]	1	4
Q.1(b)	Solve by simplex method. Maximize Z=40x1+60x2+38x3 Subject to 4x1+5x2+3x3≤90 3x1+2x2+3x3≤54 2x1+4x2+3x3≤124 x1,x2,x3≥0.	[5]	1	3
Q.2(a)	Give examples to show the use of Integer programming. Also write an algorithm for solving integer programming using branch and bound technique.	[5]	2	3
Q.2(b)	Solve the following problem Max Z = 5x1+10x2 Subject to -2x1+4x2≤6 6x1+3x2≤30 x1, x2 ≥0 x1,x2 integers	[5]	2	3
Q.3(a)	Discuss the Bisection Method using an algorithm to solve a One variable unconstraint non-linear optimization problem.	[5]	3	3
Q.3(b)	Solve the following programming problem using KKT Conditions. Maximize Z=ln(x1+1)+x2 Subject to: $2x_1+x_2 \leq 5$ $x_1,x_2 \geq 0$	[5]	3	3
Q.4(a)	Explain the steps of Simulated Annealing Algorithm taking a sample example.	[5]	4	3
Q.4(b)	Discuss the Sub-tour reversal algorithm as a local search procedure for a Travelling Salesman Problem.	[5]	4	2
Q.5(a)	Give a brief overview of the following judgmental forecasting methods: a) Sales force composite b) Delphi method	[5]	5	3
Q.5(b)	Illustrate an exponential smoothing forecasting method.	[5]	5	3

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