CLASS: BTECH   SEMESTER : V
BRANCH: CSE   SESSION : MO/2024

SUBJECT: CS341 OPTIMIZATION TECHNIQUE

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

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Q.1(a)	List at least four Optimization techniques with examples.	[2]	1	1
Q.1(b)	Formulate a LPP for the description. The World light company produces two light models. That require both metal frame and electric components. Company wants to determine how many units of each product to produce to maximize profit. For each unit of model 1, 1 unit of metal frame parts and 2 units of electrical components are required. For each unit of product 2, 3 units of metal frame parts and 2 units of electrical components are required. The company has 200 units of metal frames and 300 units of electric components. Each unit of model 1 gives profit of 50Rs and 80Rs for model 2. Excess of 60 unit for model 2 does not give any profit.	[3]	1	3
Q.2(a)	Discuss the nature and impact of OR.	[2]	2	2
Q.2(b)	Solve the LPP $x_1 - 3x_2 <= 6$, $2x_1+4x_2 >= 8$, $x_1 - 3x_2 >= -6$, $x_1, x_2 >= 0$ Maximize $z=6x_1 - 2x_2$	[3]	2	2
Q.3(a)	Discuss the conditions with example where we don't have optimal solutions.	[2]	1	2
Q.3(b)	Solve the LPP using Simplex Method Max$=Z=4x_1+x_2+4x_3+5x_4$ subject to $-4x_1+6x_2+5x_3 -4x_4 <= 20$, $3x_1-2x_2+4x_3 +x_4 <= 10$, $8x_1-3x_2+3x_3 +2x_4 <= 20$ $x_i >= 0$, for i=1,2,3,4	[3]	2	3
Q.4(a)	What is an additivity assumption ? Discuss with an example.	[2]	1	2
Q.4(b)	Solve the LPP using BIG-M Method. Max $Z=3x_1 + 2x_2$ subject to $2x_1+x_2<=2$, $3x_1+4x_2<=12$ and $x_1, x_2 >= 0$.	[3]	2	3
Q.5(a)	Can we solve the LPP without tabular form? Justify your Answer.	[2]	1	2
Q.5(b)	Solve the ILPP using Gomory's Cutting plane method Max$=Z=x_1+2x_2+3x_3-x4$ subject to $x_1+2x_2+3x_3 = 15$, $2x_1+x_2+5x_3 = 20$, $x_1+2x_2+x_3 +x_4 = 10$ $x_i >= 0$, for i=1,2,3,4	[3]	2	3

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