[M19 IT 1106]

I M. Tech I Semester (R19) Regular Examinations
OPTIMIZATION TECHNIQUES
Department of Information Technology
MODEL QUESTION PAPER

TIME: 3 Hrs. **Max. Marks: 75 M**

Answer **ONE Question** from **EACH UNIT**
All questions carry equal marks
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			CO	KL	M
		UNIT - I			
1.	a).	Classify and explain varis types of optimization problems with examples.	1	4	8
	b).	Identify the necessary & sufficient conditions for multivariable optimization problem witht constraints.	1	3	7
		OR			
2.	a).	solve the maximum or minimum of the function $f(x)=x_1^2+x_2^2+x_3^2-4x_1-8x-12x_3+56$	1	4	8
	b).	Distinguish the gradient of the function and its importance in optimization.	1	4	7
		UNIT - II			
3.	a).	Identify transportation problem and represent it mathematically.	2	3	7
	b).	Min $f(x) =x_1^2-x_1x_2+3x_2^2$. Starting point (1,2) by using steepest descent method. Solve calculations for two cycles.	1	4	8
		OR			
4.	a).	Solve the following non-LPP by Lagrangian multiplier method: Min Z= $4x_1^2+ 2x_2^2 + x_3 - 4x_1 x_2$; st $x_1 + x_2 + x_3=15$, $2x_1 - x_2 +2x_3 = 20$ and $x_i \geq 0\ \forall$ i	2	4	7
	b).	Identify the Kuhn-Tucker conditions min cost flow problem	2	3	8
		UNIT - III			
5.	a).	Compare single server and multiple server models	2	4	8
	b).	List t Probabilistic inventory control models	2	4	7
		OR			
6.	a).	Classify the terminologies involved in dynamic programming.	2	4	8
	b).	Identify the importance of gradient methods.	2	3	7
		UNIT - IV			
7.	a).	Classify the characteristics of a constrained non-linear programming problem.	3	4	8
	b).	Identify the suitable examples for design constraints and objective function	3	3	7
		OR			
8.	a).	Analyze Greedy algorithm with example	3	4	7
	b).	Prove that a graph of *n* vertices is a complete graph if its chromatic polynomials $P_n(\lambda) = \lambda (\lambda - 1) (\lambda - 2) \dots (\lambda - n + 1)$	4	5	8
		UNIT - V			
9.	a).	Identify necessary and sufficient conditions of non-LPP with single	3	3	7

		equality constraint.			
	b).	A company produces two types of hats. Each hat of first type requires twice as much as labr time as second type. If all hats are of the second type only, the company can produce a total of 500 hats a day. The market limits daily sales of the first and second type to 150 and 250 hats. Assuming that the profits per hat are Rs.8 for type A and Rs.5 for type B, In the stated problem solve: a) Design Vector b) Objective Function	3	4	8
		OR			
10.	a).	Classify balanced transportation problem.	4	4	8
	b).	List t varis methods for finding an initial basic feasible solution for a transportation problem.	4	4	7