Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

ME Semester –II Examination Dec. - 2011

Subject code: 1721205 **Date: 16/12/2011**

Subject Name: Hydro system Engineering and Management

Time: 02.30 pm – 05.00 pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1		An animal feed company must produce 200 kg of a mixture consisting of ingredient x and y daily. x costs Rs. 3 per kg and y Rs. 8 per kg. Not more than 80 kg of x can be used and at least 60 kg of y must be used. Find how much of each ingredient should be used if the company wants to minimize costs.	**14**
Q.2	**(a)**	Discuss the assumptions made in linear programming	**07**
	(b)	Define 1) Objective function 2) Slack Variable 3)Surplus Variable 4) Artificial Variable	**07**
	(b)	What are the Engineering applications of linear programming?	**07**
Q.3		A person requires 10, 12, and 12 units of chemicals A, B and C respectively for his garden. A liquid product contains 5, 2 and 1 units of A, B and C respectively per jar. A dry product contains 1, 2 and 4 units of A, B and C per carton. If the liquid product sells for Rs 3 per jar and the dry product sells for Rs 2 per carton, how many of each should be purchased in order to minimize cost and meet the requirement? Use Graphical method.	**14**
Q.3		Min $Z = 3A + 5B$ Subject to $-3A + 4B \leq 12$ $2A - B \geq -2$ $2A + 3B \geq 12$ $A \leq 4$; $B \geq 2$ and $A, B \geq 0$	**14**
Q.4	**(a)**	Explain the Primal-Dual concept of dual L-P model	**07**
	(b)	Write short note on simulation modeling.	**07**
Q.4	**(a)**	Write short note on System Engineering.	**07**
	(b)	Discuss ANN (Artificial Neural Network)	**07**
Q.5	**(a)**	Discuss the Objective Function of water resources project.	**07**
	(b)	Explain the Kuhn Tucker conditions and Langrangian multiplier.	**07**
Q.5	**(a)**	Explain Dynamic programming and it's characteristics with merits and demerits.	**07**
	(b)	How the Non-linear function can be made Linear?	**07**

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