Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E –IIst SEMESTER–EXAMINATION – JULY- 2012

Subject code: 1721205 **Date: 12/07/2012**

Subject Name: Hydro System Engineering and Management

Time: 10:30 am – 13:00 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		Maximize $Z = 10A + B + 2C$ Subject to constraints $A+B-2C \leq 10$ $4A + B + C \leq 20$ $A, B, C \geq 0$ Use Simplex method.	**14**
Q.2	**(a)**	Define: SlackVariable,Surplus variable, Objective function, Unbounded solution.	**07**
	(b)	Discuss the Assumptions made in Linear programming.	**07**
	(b)	Explain Dynamic Programming and it's characteristics with merits and demerits.	**07**
Q.3	**(a)**	Explain the Primal-Dual concept of dual LP-model	**07**
	(b)	Explain Kuhn-Tucker conditions and Langrangian multiplier	**07**
Q.3	**(a)**	Explain Big –M method in detail.	**07**
	(b)	Write dual of Maximize $Z= 3a-2b$ subject to constraints $a \leq 4$, $b \leq 6$, $a + b \leq 5$, $-b \leq -1$, $a,b \geq 0$	**07**
Q.4	**(a)**	Explain the concept of system and applications of system Engineering in the field of water resources.	**07**
	(b)	Write short note on Artificial Neural Network	**07**
Q.4	**(a)**	Discuss the limitations of linear programming.	**07**
Q.4	**(b)**	Explain Gomory's cutting plane method.	**07**
Q.5	**(a)**	Discuss use of space and peck rule for reservoir operation.	**07**
	(b)	Classify the models by nature of environment, behavior and method of solution.	**07**
Q.5	**(a)**	Explain How non-linear function can be made linear.	**07**
	(b)	Write short note on simulation modeling.	**07**

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