Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME- SEMESTER II– EXAMINATION – SUMMER 2015

Subject Code: 2723302 **Date: 28/05/2015**

Subject Name: Hydro System Engineering

Time: 2:30 PM – 5:00 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	**(a)**	Explain the concept of 'system' and application of system engineering in the field of water resources.	**07**
	(b)	Discuss the assumptions and limitations of linear programming	**07**
Q.2	**(a)**	Define the following terms: (i) Slack variable, (ii) Surplus variable and (iii) Objective function	**07**
	(b)	Use the graphical method to solve the following LP problem. Minimize $Z=3x_1 + 2x_2$ Subject to the constraints $5x_1 + x_2 \geq 10$ $x_1 + x_2 \geq 6$ $x_1 + 4x_2 \geq 12$ $x_1 , x_2 \geq 0$	**07**
		OR	
	(b)	Discuss how the optimal solution to the LP problem can be obtained by the graphical method.	**07**
Q.3	**(a)**	Define the following terms: (i) Local maximum (ii) Local minimum (iii)Global maximum (iv) Global minimum	**07**
	(b)	Differentiate between the primal simplex method and the dual simplex method.	**07**
		OR	
Q.3	**(a)**	Describe the general mathematical model of linear programming problem.	**07**
	(b)	Discuss Kuhn-Tucker necessary conditions for non-linear LP problem.	**07**
Q.4	**(a)**	Explain Big M method in detail.	**07**
	(b)	Explain Dynamic programming and its characteristics with merits and demerits.	**07**
		OR	
Q.4	**(a)**	Explain Simplex Algorithm with a flow chart.	**07**
	(b)	Discuss how linear programming can be used to determine the reservoir capacity.	**07**
Q.5	**(a)**	Write shot note on Artificial Neural Network	**07**
	(b)	Write short note on Simulation Modeling.	**07**
		OR	
Q.5	**(a)**	Write short note on general structure of LP model.	**07**
	(b)	Write short note on characteristics of a DP problem.	**07**

****