Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – II • EXAMINATION – SUMMER • 2014

Subject code: 1721205 **Date: 23-06-2014**

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	**(a)**	Discuss the advantages of linear programming	**07**
	(b)	Define: 1) Slack variable 2) Surplus variable 3) Objective function	**07**
Q.2	**(a)**	Discuss the assumptions and limitations of linear programming.	**07**
	(b)	Derive the Kuhn- Tucker conditions for non-linear programming problem.	**07**
		OR	
	(b)	What is Langrangian multiplier? How do you formulate Langrangian function for nonlinear equality constraints?	**07**
Q.3	**(a)**	Differentiate between deterministic and stochastic programming.	**07**
	(b)	Explain Dynamic programming and its characteristics. Also state its merits and demerits.	**07**
		OR	
Q.3		Maximize Z = 120A + 100B Subject to Constraints 10A + 5B Ò 80 6A + 6B Ò 66 4A + 8B Ó 24 5A + 6B Ò 90 A, B Ó 0 Solve the problem by Graphical Method.	**14**
Q.4		Maximize Z = 3A + 2B + 5C Subject to constraints A + 2B + C Ò 430 3A + 2C Ò 460 A + 4B Ò 420 A, B, C Ó 0 Solve the problem by Simplex method.	**14**
		OR	
Q.4	**(a)**	Write short note on ANN(Artificial Neural Network)	**07**
	(b)	Explain how the non-linear programming problem can be made linear.	**07**
Q.5	**(a)**	Explain the concept of ósystemô and application of system Engineering in the field of water resources.	**07**
	(b)	Discuss the use of Simulation Technique in water resources.	**07**
		OR	
Q.5	**(a)**	State Bellmanôs principle of optimality and explain by illustration how it can be used to solve multistage decision problem.	**07**
	(b)	Discuss in brief óDualityô in linear programming. When is it advantageous to solve a LPP by dual simplex method?	**07**

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