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 **14**

$$10A + 5B \leq 80$$
$$6A + 6B \leq 66$$
$$4A + 8B \geq 24$$
$$5A + 6B \leq 90$$

A, B $\geq$ 0 Solve the problem by Graphical Method.

Q.4 Maximize Z = 3A + 2B + 5C Subject to constraints **14**

$$A + 2B + C \leq 430$$
$$3A + 2C \leq 460$$
$$A + 4B \leq 420$$

A, B, C $\geq$ 0 Solve the problem by Simplex method.

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 ‑system‖ 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 Bellman‖s principle of optimality and explain by illustration how it can be used to solve multistage decision problem.	**07**
	(b)	Discuss in brief ‑Duality‖ in linear programming. When is it advantageous to solve a LPP by dual simplex method?	**07**

****