Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject code: 710701 N Date: 05/07/2012

Subject Name: Power System Modeling and Simulation

Time: 2:30 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)**	Explain following terms: Branch, Link, Nodes, Graph and Oriented graph	**07**
	(b)	Define following network matrices. 1 Basic Incidence matrix (A) 2 Basic Loop matrix (B) 3 Basic cutest matrix (C) 4 Branch Path Incidence matrix (K)	**07**
Q.2	**(a)**	Derive the equation to find fault current, fault voltage in a n- bus power system with fault at bus 'r' with fault impedance Z_f.	**07**
	(b)	State and justify all the assumption made in short circuit analysis. State applications of short circuit analysis.	**07**
		OR	
	(b)	What are the applications of Load Flow Study.	**07**
Q.3	**(a)**	Write down SLFE equations for load flow study and give bus classification stating importance of each in load flow study.	**07**
	(b)	Explain approximate load flow method for n – bus power system and derive necessary equations.	**07**
		OR	
Q.3	**(a)**	What are the factors which affects security of power system?	**07**
	(b)	Explain AC power flow method for security analysis.	**07**
Q.4	**(a)**	Explain state estimation by orthogonal decomposition.	**07**
	(b)	Explain Observability and Pseudo measuremts.	**07**
		OR	
Q.4	**(a)**	Explain Sparsity techniques and its advantages.Give any one method to store sparse matrix in computer.	**07**
	(b)	Explain Bewely's lattice diagram.	**07**
Q.5	**(a)**	Draw flowchart for NR method for n – bus power system for PV and PQ buses.	**07**
	(b)	Prepare the algorithm for short circuit study.	**07**
		OR	
Q.5	**(a)**	Explain concept of optimal power flow.	**07**
	(b)	Explain One step method of Numerical Integration technique.	**07**

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