Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – I • EXAMINATION – WINTER 2012

Subject code: 710701N **Date: 08-01-2013**

Subject Name: Power System Modeling and Simulation

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)	Explain the following numerical integration method (1) Forward Euler's method . (2) Range-Kutta mehod..	07
	(b)	Write a short note on Step-Size selection with respect to Numerical integration technique.	07
Q.2	(a)	Ybus is available. Describe the method of getting Zbus from Ybus.	07
	(b)	What is Continuation Power Flow (CPF)? How it is different from the normal load flow? What additional information is required for & available from the CPF?	07
		OR	
	(b)	Give bus classification stating importance of each in load flow study.	07
Q.3	(a)	What are the factors that affect power System Security? Explain the concept of "Optimal Power Flow with Power System Security"	07
	(b)	With respect to Power System Security Explain the concept of "Contingency Analysis." Draw the relevant Flow Chart.	07
		OR	
Q.3	(a)	Explain the Application of Power System State Estimation by drawing a schematic diagram.	07
	(b)	How will the breakers and switches in any substation *can* cause the network topology to change? Explain with suitable diagrams. Hence explain the importance of Network Topology with respect to State Estimation.	07
Q.4	(a)	Explain Application of Sparsity Techniques to power system. Explain the Linked List Method to store sparse matrix in computer.	07
	(b)	What is travelling waves? How are they generated? Discuss the effect of travelling waves on short-circuited transmission line.	07
		OR	
Q.4	(a)	Explain Bewleys Lattice diagram with neat sketch. What information are obtained from Bewleys Lattice diagram?	07
Q.4	(b)	Explain Network Observability and Pseudo Measurements with respect to State Estimation.	07
Q.5	(a)	Describe the steps for formation of [Ybus] using singular transformation method. ([Ybus] = A^T Y A). Also explain when [Ybus] becomes symmetrical and when it becomes unsymmetrical.	07
	(b)	With respect to State Estimation in Power Systems, how will you detect and Identify Bad measurements?	07
		OR	
Q.5	(a)	Compare GS, NR, Decoupled, Fast Decoupled method of solving load flow equations.	07
	(b)	Explain DC load flow study stating its conditions. What are its Merits and Demerits?	07

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