Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – I • EXAMINATION – WINTER • 2014

Subject code: 2710711 **Date: 07-01-2015**

Subject Name: Computer Methods in Power System Analysis

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)**	Define and explain Fundamental Cut-set Matrix with example.	**07**
	(b)	Describe the differences between the GS method and NR method in relation to power flow analysis.	**07**
Q.2	**(a)**	Explain the algorithm of GS method of power flow analysis.	**07**
	(b)	Describe the flowchart of NR method of power flow analysis.	**07**
		OR	
	(b)	Describe the Decoupled Load Flow (DLF). How is it better than NR method?	**07**
Q.3	**(a)**	Define and explain (1) Generation shift factor (2) Line outage distribution factor	**07**
	(b)	Explain concentric relaxation technique with suitable example.	**07**
		OR	
Q.3	**(a)**	Mention the steps of symmetrical fault analysis using bus impedance matrix of a power system.	**07**
	(b)	Explain performance index. How is it useful to contingency selection?	**07**
Q.4	**(a)**	Explain the network observability and pseudo measurements in relation to state estimation.	**07**
	(b)	Write a short note on state estimation by orthogonal decomposition.	**07**
		OR	
Q.4	**(a)**	With suitable example explain the weighted least square state estimation.	**07**
	(b)	Prepare a flow chart for any one state estimation method except the weighted least square state estimation.	**07**
Q.5	**(a)**	Briefly explain Single step methods, Multi step methods, Explicit methods and Implicit methods of numerical integration.	**07**
	(b)	What do you mean by a Stiff system? How the selection of step size plays important role for numerical integration for Stiff systems?	**07**
		OR	
Q.5	**(a)**	Write the first order differential equation of series R-L circuit connected to a DC voltage source. Explain the steps to solve this equation using Forward Euler Method.	**07**
	(b)	Take an example of a full square matrix of size (3 by 3) and obtain upper triangular matrix from the same. Explain the steps.	**07**

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