Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VIII (NEW) EXAMINATION – WINTER 2017

Subject Code: 2180909 Date: 15/11/2017

Subject Name: Power System Operation and Control

Time:02:30 PM TO 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 surge impedance loading with it expression.	**03**
	(b)	Differentiate automatic generation control action from governor action.	**04**
	(c)	Define various operating states of power system, nature of various control actions and their significance.	**07**
Q.2	**(a)**	List a few practical aspects for describing the reactive power flow problem in voltage collapse	**03**
	(b)	Compare static state estimation and dynamic state estimation.	**04**
	(c)	Establish relationships between voltage regulation and reactive power. Explain how it is governed by short-circuits capacity.	**07**
		OR	
	(c)	Discuss two-area frequency control with block diagram.	**07**
Q.3	**(a)**	Define generation shift factor and line outage distribution factor in relation to security analysis.	**03**
	(b)	Illustrate standard analytical functions used for Extrapolation techniques involve trend curve fitting in load forecasting.	**04**
	(c)	Describe Auto-Regressive Model and Auto- regressive Moving Average Model for load forecasting.	**07**
		OR	
Q.3	**(a)**	Explain significance of ‘w’ in weighted least square estimation.	**03**
	(b)	Define load forecasting. Give summary of nature of load forecasting based on lead time with its application.	**04**
	(c)	Discuss estimation of average and trend terms for any load data.	**07**
Q.4	**(a)**	Find the capacity of a static VAR compensator to be installed at a bus with +/-5 % voltage fluctuation. The short –circuit ratio is 5000MVA.	**03**
	(b)	Show and discuss profile of reactive power losses in transmission line.	**04**
	(c)	Give flow chart for contingency selection.	**07**
		OR	
Q.4	**(a)**	Obtain necessary relation between maximum power and line length.	**03**
	(b)	Give graphical representation of enhancement of line length and steady state stability limit of uncompensated transmission line and discuss it.	**04**
	(c)	Explain how estimation of non linear measurements is done using Weighted LSE.	**07**
Q.5	**(a)**	State research and Professional bodies of Indian power Sector.	**03**
	(b)	Give flow chart of one scheme of fast decoupled state estimation.	**04**
	(c)	Explain function of different entities in deregulated power system.	**07**
		OR	
Q.5	**(a)**	List main components of Automatic voltage control scheme.	**03**
	(b)	How does deregulated power system differs from vertically integrated electric industry?	**04**
	(c)	List out and Discuss the reasons which motivate to restructure the power system.	**07**

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