Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– VIII (New) EXAMINATION – WINTER 2019

Subject Code: 2180909 **Date: 25/11/2019**

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.**

			MARKS
Q.1	**(a)**	State operating states with nature of control action in a power system.	**03**
	(b)	Write importance of frequency and voltage control.	**04**
	(c)	Explain operation of transmission line for no load condition.	**07**
Q.2	**(a)**	Draw block diagram which shows state estimation.	**03**
	(b)	Explain how a relationship between voltage regulation and reactive power is governed by short-circuits capacity of transmission line.	**04**
	(c)	Describe least square approximation state estimation.	**07**
		OR	
	(c)	Explain the effect of tap-changing transformer in voltage control of a transmission line	**07**
Q.3	**(a)**	State and Define sensitivity factors with mathematical model.	**03**
	(b)	Explain System monitoring and Contingency Analysis related to power system security.	**04**
	(c)	Derive equation which shows relation between maximum power and line length of power line.	**07**
		OR	
Q.3	**(a)**	Show graphical representation of power transfer and line length.	**03**
	(b)	List a few practical aspects for describing the reactive power flow problem resulting voltage collapse.	**04**
	(c)	Prove that the receiving end voltage is extremely sensitive to any change in power status at the receiving end bus.	**07**
Q.4	**(a)**	Classify bad data for state estimation.	**03**
	(b)	Describe steps for detection of bad data.	**04**
	(c)	Briefly discuss the concept of "Control Area" for automatic Load Frequency Control and hence explain two Area Load Frequency Control.	**07**
		OR	
Q.4	**(a)**	List out different load forecasting methods.	**03**
	(b)	Discuss reflection of load forecasting in current and future trends of power system.	**04**
	(c)	A 100 MVA, 50 Hz synchronous generator having inertia constant of the machine as 5 kW-sec per kVA. The load suddenly increases by 50 MW. Due to delay in governor action there is a delay of 0.6 seconds in opening of steam valve. Find the frequency deviation.	**07**
Q.5	**(a)**	Explain static and dynamic state estimation.	**03**
	(b)	Discuss international scenario related to deregulation.	**04**
	(c)	Explain power sector scenario of India.	**07**
		OR	
Q.5	**(a)**	Differentiate Regulated power system and Deregulated power system.	**03**
	(b)	Explain importance of state estimation in power system.	**04**
	(c)	Explain deregulation of power supply and state it's benefits	**07**

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