Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII (NEW) EXAMINATION – SUMMER 2022

Subject Code:3170919 Date:10/06/2022

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.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	Explain the concept of SIL with necessary calculations.	**03**
	(b)	Explain about the combined operation of load frequency control & Economic Dispatch control.	**04**
	(c)	Explain optimal load frequency control for two area control system.	**07**
Q.2	**(a)**	Explain the role of Power System Security in Power System Operation.	**03**
	(b)	Give the classification of Various State of Power system.	**04**
	(c)	Develop a relation between voltage and reactive power at a node in a power system.	**07**
		OR	
	(c)	What is decoupling concept? Show that for a lossless transmission two-bus model, Q-V and P-δ quantities are closely coupled.	**07**
Q.3	**(a)**	Explain the reactive loss characteristics of a transmission line.	**03**
	(b)	Explain the concept of state estimation and briefly describe the necessity of state estimation.	**04**
	(c)	Explain the concept of contingency Analysis and Derive the equations of sensitivity factors in the system.	**07**
		OR	
Q.3	**(a)**	Explain Network Observability and Pseudo-Measurements.	**03**
	(b)	What is load forecasting? Give its objectives.	**04**
	(c)	Explain function of different entities in Deregulated Power System.	**07**
Q.4	**(a)**	Give the Comparison of Static and Dynamic State Estimation.	**03**
	(b)	Obtain the necessary relation between maximum power and line length.	**04**
	(c)	Describe Auto Regressive Model and Auto Regressive Moving Average Model for load forecasting.	**07**
		OR	
Q.4	**(a)**	What is line load ability? Obtain an expression for load ability.	**03**
	(b)	Give Flow chart of one scheme of Fast Decoupled State Estimation.	**04**
	(c)	List the entities involved in Electricity market and its role in restructuring power system.	**07**
Q.5	**(a)**	Explain the least square method for state estimation.	**03**
	(b)	List Out Different Load Forecasting Methods.	**04**
	(c)	Explain the factors which motivate for the Restructuring and Deregulation of Power System.	**07**
		OR	

Q.5	**(a)**	Express Computational Considerations of state estimation of power system.	**03**
	(b)	State and explain the techniques use for data treatment.	**04**
	(c)	Explain Tracking State Estimation of Power Systems.	**07**

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