Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII (NEW) EXAMINATION – WINTER 2023

Subject Code:3170915 Date:16-12-2023

Subject Name: Power System Dynamics and Control

Time: 10:30 AM TO 01:00 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)**	What is meant by speed governing system?	**03**
	(b)	State basic assumptions made in steady state analysis of an alternator.	**04**
	(c)	Briefly describe Park's transformation and explain its importance in power system modeling and analysis	**07**
Q.2	**(a)**	Draw the systematic diagram for 3phase synchronous machine.	**03**
	(b)	Define Per unit Stator Voltage Equation.	**04**
	(c)	Mention the names of load models used in dynamic analysis. Describe any two of them in detail	**07**
		OR	
	(c)	Draw and explain the functional block diagram of excitation control system.	**07**
Q.3	**(a)**	Describe the damping torque analysis.	**03**
	(b)	Explain Field Shorting Circuit.	**04**
	(c)	What is Sub-Synchronous Resonance (SSR)? Explain any one SSR mitigation technique.	**07**
		OR	
Q.3	**(a)**	Explain Surge Impedance Loading.	**03**
	(b)	Explain Under excitation Limiter.	**04**
	(c)	Briefly explain synchronizing and damping torque analysis.	**07**
Q.4	**(a)**	Explain Single Pole Switching.	**03**
	(b)	Explain PID Governor.	**04**
	(c)	Briefly describe voltage instability with the help of a PV diagram.	**07**
		OR	
Q.4	**(a)**	Mention the common assumptions in transient analysis of a multi-machine system.	**03**
	(b)	Explain the Mechanical hydraulic control system.	**04**
	(c)	Draw the control characteristic and briefly explain the Static Var Compensator.	**07**
Q.5	**(a)**	Explain Reactor Switching.	**03**
	(b)	Explain any one model of the steam turbine	**04**
	(c)	Explain the transient stability improvement by series compensation.	**07**
		OR	
Q.5	**(a)**	Briefly explain the procedure of small signal analysis.	**03**
	(b)	Explain PV and QV curves with neat diagrams.	**04**
	(c)	What is PSS? Explain with neat block diagram.	**07**

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