Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–VII (NEW) EXAMINATION – WINTER 2024

Subject Code:3170921 Date:19-11-2024

Subject Name: Power Quality and FACTS

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 Power Quality and its importance?	**03**
	(b)	Discuss Impulse transients and Oscillatory transients.	**04**
	(c)	What is role of Grounding in terms of Power Quality. Discuss Single-point and Multipoint grounding.	**07**
Q.2	**(a)**	What is load compensation?	**03**
	(b)	Explain Applications of SVC and STATCOM devices.	**04**
	(c)	Explain the role of SVC device for Reactive Power Compensation.	**07**
		OR	
	(c)	Discuss different Static Var Compensators.	**07**
Q.3	**(a)**	What are the types of FACTS controllers?	**03**
	(b)	Describe Power Oscillation Damping and Sub synchronous resonance damping enhancement.	**04**
	(c)	Explain the schematic diagram and working principle of a STATCOM.	**07**
		OR	
Q.3	**(a)**	What are the major sources of current harmonics?	**03**
	(b)	What is inter-harmonics and sub-harmonics?	**04**
	(c)	Discuss harmonics in a Thyristor-Controlled Reactor.	**07**
Q.4	**(a)**	Explain the role of Harmonic Filters in Harmonics Mitigation.	**03**
	(b)	What is THD? Describe the Power Quality Standards for THD.	**04**
	(c)	How Static Var Compensators (SVCs) are used to improve transient stability of the power system.	**07**
		OR	
Q.4	**(a)**	Explain the Harmonics Effects in 3-Phase Transformer.	**03**
	(b)	Discuss the application of harmonics standards for utility systems.	**04**
	(c)	Explain working of RMS Meter and Flicker Meter with necessary diagrams.	**07**
Q.5	**(a)**	What is flicker? List reasons responsible for flicker.	**03**
	(b)	Compare the harmonics due to DC drives and AC drives.	**04**
	(c)	Discuss Power system harmonic analyzer.	**07**
		OR	
Q.5	**(a)**	Give Differences between IEEE 519-1992 and IEC 61000-Series Standards.	**03**
	(b)	What are CBEMA and ITI Curves?	**04**
	(c)	Discuss the measurement of frequency response of instrument transformer.	**07**

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