Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII EXAMINATION – SUMMER 2025

Subject Code:3170921 Date:08-05-2025

Subject Name:Power Quality and FACTS

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)**	Enlist common disturbances in power systems.	**03**
	(b)	Explain solutions to power quality problems in brief.	**04**
	(c)	Discuss significance of grounding in power system. Elaborate single-point and multipoint grounding.	**07**
Q.2	**(a)**	What are the different types of FACTS controllers?	**03**
	(b)	Discuss load compensation.	**04**
	(c)	Compare different static Var systems and discuss specification of SVCs.	**07**
		OR	
	(c)	Describe STATCOM.	**07**
Q.3	**(a)**	How reactive power control and coordination can be done by SVCs?	**03**
	(b)	Discuss saturated reactor.	**04**
	(c)	Demonstrate control systems for SVCs in traction application.	**07**
		OR	
Q.3	**(a)**	Explain significance of pulse-width modulation.	**03**
	(b)	Discuss harmonics due to inrush current in transformer.	**04**
	(c)	Illustrate harmonics in arc furnace loads and a rotating machine.	**07**
Q.4	**(a)**	Discuss harmonics limits.	**03**
	(b)	Compare IEEE 519-1992 and IEC 61000-Series Standards.	**04**
	(c)	Explain undesirable effects of harmonics. Discuss harmonic sources in brief.	**07**
		OR	
Q.4	**(a)**	List out types of harmonic filters.	**03**
	(b)	Compare tuned and damped harmonic filters.	**04**
	(c)	Demonstrate design of single-tuned filters.	**07**
Q.5	**(a)**	Write short note on true RMS meter.	**03**
	(b)	Explain the features of flicker meters.	**04**
	(c)	Describe the objectives and procedures for performing power quality monitoring.	**07**
		OR	
Q.5	**(a)**	Explain application of synchronous condensers.	**03**
	(b)	What are inter-harmonics and sub-harmonics?	**04**
	(c)	Discuss harmonic analyzer.	**07**

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