Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER– VII EXAMINATION – SUMMER 2026

Subject Code:3170921 Date:20-05-2026

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)**	Define flicker. List reasons responsible for flicker.	**03**
	(b)	Discuss the sources of voltage sag.	**04**
	(c)	What do you mean by term "power quality"? Discuss all the power quality issues in brief.	**07**
Q.2	**(a)**	Explain single point and multi point grounding	**03**
	(b)	What are the types of FACTS controllers?	**04**
	(c)	Explain the role of SVC device for Reactive Power Compensation with necessary diagrams.	**07**
		OR	
	(c)	Write Short Note on Reactive Power Compensation and Also explain the comparison of Series & Shunt Compensation.	**07**
Q.3	**(a)**	Explain the role of Grounding in terms of Power Quality.	**03**
	(b)	State the importance of power factor in industry as per power quality study.	**04**
	(c)	Explain the working of SVC device using TSC-TCR with necessary diagrams.	**07**
		OR	
Q.3	**(a)**	Explain the concept of Harmonics and its side effects in Power System.	**03**
	(b)	Explain application of synchronous condensers.	**04**
	(c)	Explain the schematic diagram and working principle of a STATCOM.	**07**
Q.4	**(a)**	Classify different types of harmonics filter.	**03**
	(b)	Write a Short Note on Harmonic Analyzer.	**04**
	(c)	Mention the methods of passive reactive power compensation. Compare them with compensation using FACTS devices.	**07**
		OR	
Q.4	**(a)**	Explain single-tuned filter for harmonic reduction.	**03**
	(b)	Write short note on true RMS meter.	**04**
	(c)	What are CBEMA and ITIC graphs? Draw and discuss the ITIC graph in detail.	**07**
Q.5	**(a)**	Define: 1.Linear Loads 2.Inrush Current 3.Voltage Swell	**03**
	(b)	Give the Difference between Shunt And Series Active Power Filter.	**04**
	(c)	Describe the objectives and procedures for performing power quality monitoring.	**07**
		OR	
Q.5	**(a)**	What are the various instruments used for power quality measurements?	**03**
	(b)	Explain the role of Synchronous Condenser and Capacitor bank.	**04**
	(c)	Discuss the effect of harmonics on transformer and derive expression for k factor.	**07**

****