Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–VII EXAMINATION – WINTER 2025

Subject Code:3170917 Date:20-11-2025

Subject Name:High Voltage Engineering

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)**	Give comparison between uniform and non-uniform Field.	**03**
	(b)	Explain the time lags for breakdown.	**04**
	(c)	Give methods for electric field computation and explain anyone.	**07**
Q.2	**(a)**	Differentiate between Commercial Liquid and pure Liquid.	**03**
	(b)	Explain treeing and tracking related to solid breakdown.	**04**
	(c)	Define Electric stress. Explain Electric field stress in homogeneous isotropic materials.	**07**
		OR	
	(c)	Define Townsend's first and second ionization coefficients. Obtain Current growth equation due to first and second ionization.	**07**
Q.3	**(a)**	Draw & Discuss Equivalent circuit of partial discharge.	**03**
	(b)	Describe the working of a Van de Graff generator with a neat sketch.	**04**
	(c)	Explain capacitance voltage Transformer with its schematic representation, Equivalent circuit and its phasor diagram.	**07**
		OR	
Q.3	**(a)**	Discuss advantages and disadvantages of series parallel resonant circuit.	**03**
	(b)	Draw and explain Marx circuit and modified Marx Circuit of multistage impulse generator.	**04**
	(c)	Enlist different theories of breakdown in commercial liquids and explain any one of them.	**07**
Q.4	**(a)**	Enlist the breakdown mechanisms for solid dielectric.	**03**
	(b)	Explain particle exchange mechanism for vacuum breakdown.	**04**
	(c)	Explain the high voltage Schering bridge for the tan δ and capacitance measurement.	**07**
		OR	
Q.4	**(a)**	Explain thermal breakdown in solid dielectric.	**03**
	(b)	Explain purification method for liquid dielectric.	**04**
	(c)	Explain principle of Electrostatic voltmeter and limitation of it for high voltage measurement.	**07**
Q.5	**(a)**	List out the common test facilities available in High Voltage Lab.	**03**
	(b)	Explain Metal Oxide Arrestor.	**04**
	(c)	Enlist the high voltage tests to be performed on power transformer and explain any one in detail with relevant sketch	**07**

OR

Q.5	**(a)**	What are the different methods of high DC voltage Measurement? Explain generating voltmeter method in detail.	**03**
	(b)	Explain the tests to be carried out on an insulator.	**04**
	(c)	Describe various tests to be carried out on a circuit breaker.	**07**

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