Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code:3170917 Date:22-05-2024

Subject Name:High Voltage Engineering

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)**	Explain partial discharge.	**03**
	(b)	Give comparison between uniform and non-uniform Field.	**04**
	(c)	Explain High voltage Schering bridge for tanδ and capacitance measurement of Insulators.	**07**
Q.2	**(a)**	Discuss power frequency tests of insulator.	**03**
	(b)	How are switching impulse generated in Laboratory, Explain in brief.	**04**
	(c)	Explain with neat diagram the principle & construction of an electrostatic voltmeter.	**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)**	Explain Sweep Frequency Response Analysis (SFRA).	**03**
	(b)	Explain Finite Element Method (FEM).	**04**
	(c)	Draw symbolic Construction of Van-De-Graff generator and explain its working. Also mention its applications with merits and demerits.	**07**
		OR	
Q.3	**(a)**	Discuss Hall effect in Hall generator.	**03**
	(b)	How Potential Divider method used for measurement of high voltage DC with its limitations.	**04**
	(c)	Differentiate between Marx & modified Marx circuit for multistage impulse generators with circuit.	**07**
Q.4	**(a)**	Explain front and tail times of an impulse wave with neat sketch.	**03**
	(b)	Explain breakdown test for Transformer oil.	**04**
	(c)	Explain Voltage Multiplier Circuit for generation of High Voltage.	**07**
		OR	
Q.4	**(a)**	List out the common test facilities available in High Voltage Lab.	**03**
	(b)	Discuss factors affecting breakdown of gases.	**04**
	(c)	What is meant by insulation co-ordination? How are the protective devices chosen for optimal insulation level in power system?	**07**
Q.5	**(a)**	What is surge arrester? Explain in brief.	**03**
	(b)	Explain Tesla coil with its circuit & Waveform.	**04**
	(c)	Explain corona discharge.What are different factor affecting Corona losses? How Corona loss can be eliminated?	**07**
		OR	
Q.5	**(a)**	Explain high voltage test on Insulator.	**03**
	(b)	List out the causes of overvoltage in power voltage.	**04**
	(c)	Explain working of sphere gap and also explain factor influence such a voltage measurement.	**07**