Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (OLD) - EXAMINATION – SUMMER 2017

Subject Code: 160904 **Date: 05/05/2017**

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.**

Q.1	**(a)**	Explain charge simulation method for evaluation of electric field distribution.	**07**
	(b)	Describe, with neat sketch, the working of a Van de Graff generator. Also state its applications.	**07**
Q.2	**(a)**	Starting from basic Marx circuit, develop the circuit of a modern multi-stage impulse generator and explain its operation. Discuss the significance of various parameters.	**07**
	(b)	What is the principle of operation of resonant transformer? How is it advantageous over the cascade connected transformers?	**07**
		OR	
	(b)	Explain with neat diagram the principle of operation of an Electrostatic Voltmeter. Discuss its advantages and limitations for high voltage measurements.	**07**
Q.3	**(a)**	Draw a neat schematic diagram of a generating voltmeter and explain its principle of operation. Discuss its application and limitations.	**07**
	(b)	Give the schematic arrangement of an impulse potential divider with an oscilloscope connected for measuring impulse voltages. Explain the arrangement used to minimize errors.	**07**
		OR	
Q.3	**(a)**	What is treeing and tracking? Explain in concern with solid breakdown.	**07**
	(b)	Explain various theories of breakdown in commercial liquid dielectrics.	**07**
Q.4	**(a)**	State and explain Paschen's law. How do you account for the minimum voltage for breakdown under a given *pd* condition?	**07**
	(b)	Explain the Streamer theory of breakdown in air at atmospheric pressure.	**07**
		OR	
Q.4	**(a)**	Define and derive Townsend's first and second ionization coefficients.	**07**
	(b)	What is non-destructive testing of insulating materials? Explain various non-destructive test techniques.	**07**
Q.5	**(a)**	With the help of Volt-Time characteristics, Explain 'Insulation Coordination' for Power System apparatus.	**07**
	(b)	Mention various types of lightning arrestors and write a comprehensive note on metal oxide arrestors.	**07**
		OR	
Q.5	**(a)**	What are types of partial discharges? Describe the method of partial discharge measurements.	**07**
	(b)	List out various tests to be carried out on insulator and explain each test briefly.	**07**

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