Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI • EXAMINATION – SUMMER 2013

Subject Code: 160904 **Date: 29-05-2013**

Subject Name: High Voltage Engineering

Time: 10.30 am - 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 corona discharge. Discuss concept of positive corona and negative corona.	**07**
	(b)	Explain streamer theory of breakdown in gases.	**07**
Q.2	**(a)**	What is Paschen's law? Explain significance of existence of minimum sparking potential in paschen's curve.	**07**
	(b)	Explain Thermal breakdown in solid dielectric.	**07**
		OR	
	(b)	Explain breakdown and filteration tests for liquid dielectric.	**07**
Q.3	**(a)**	Explain cavitation & bubble theory and stressed oil volume theory of liquid dielectric.	**07**
	(b)	A 10 stage cockraft-Walton circuit has all capacitors of 0.06 µF. The secondary voltage of the supply transformer is 100KV at a frequency of 150 Hz. If the load current is 1 mA, Determine (1) voltage regulation (2) The ripple (3) The optimum number of stages for maximum output voltage. (4) The Maximum output voltage.	**07**
		OR	
Q.3	**(a)**	Draw & explain Marx circuit and modified Marx circuit of multistage impulse generator. Discuss differences between these two.	**07**
	(b)	Write short notes on Van de Graaff Generator.	**07**
Q.4	**(a)**	Explain how a sphere gap can be used to measure the peak value of voltages. What are the parameters & factors that influence such voltage measurements.	**07**
	(b)	What is meant by insulation co-ordination? How are the protective devices chosen for optimal insulation level in a power system?	**07**
		OR	
Q.4	**(a)**	Discuss measurement of dielectric constant and loss tangent of capacitor.	**07**
	(b)	Explain partial measurement test for insulation quality assessment.	**07**
Q.5	**(a)**	Draw & explain series capacitor peak voltmeter	**07**
	(b)	Explain test facilities and testing equipments in high voltage Laboratories.	**07**
		OR	
Q.5	**(a)**	Discuss High Voltage Schering Bridge.	**07**
	(b)	Explain with neat diagram the principle of operation of an electrostatic voltmeter. Discuss its advantages and limitations for high voltage measurements.	**07**

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