Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI • EXAMINATION – WINTER • 2014

Subject Code: 160904 Date: 05-12-2014

Subject Name: High Voltage Engineering

Time: 02:30 pm - 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.**

Q.1	**(a)**	Explain streamer theory of breakdown in gases.	**07**
	(b)	Explain the different electrical tests done on isolators and circuit breakers.	**07**
Q.2	**(a)**	What are treeing and tracking? Explain this two phenomenon in solid dielectrics.	**07**
	(b	Explain the various theories that explain breakdown in commercial liquid dielectrics.	**07**
		OR	
	(b)	Explain impulse testing of power transformer with a diagram of set up.	**07**
Q.3	**(a)**	Describe with a neat sketch the working of a Van de Graph generator. What are the factors that limit the maximum voltage obtained?	**07**
	(b)	Explain resonant transformer for high voltage AC generation. Discuss the advantages and limitations of it.	**07**
		OR	
Q.3	**(a)**	Draw and explain Marx circuit and modified Marx circuit of multi stage impulse generator. Discuss differences between these two.	**07**
	(b)	A 12-stage impulse generator has 0.126 μF capacitors. The wave front and the wave tail resistances connected are 800 Ω and 5000 Ω respectively. If the load capacitor is 1000 pF, find the front and tail times of the impulse wave produced.	**07**
Q.4	**(a)**	Explain how a sphere gap can be used to measure the peak value of voltages. What are the parameters and factors that influence such voltage measurement?	**07**
	(b)	Explain with neat diagram the principle of operation of an electrostatic voltmeter. Discuss its advantages and limitations for high voltage measurement.	**07**
		OR	
Q.4	**(a)**	What is meant by insulation co-ordination? How are the protective devices chosen for optimal insulation level in power system?	**07**
	(b)	Explain the lightning mechanism including stepped leader stroke and power return stroke with appropriate diagram.	**07**
Q.5	**(a)**	Explain high voltage test on insulator.	**07**
	(b)	Discuss high voltage Schering bridge.	**07**
		OR	
Q.5	**(a)**	Write a comprehensive note on metal oxide arrestors.	**07**
	(b)	Write a short note on design and layout of high voltage laboratory.	**07**

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