Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VIII EXAMINATION – SUMMER 2016

Subject Code:180805 **Date:16/05/2016**

Subject Name:High Voltage Engineering (Department Elective - II)

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)**	Why is a Cockcroft-Walton circuit preferred for voltage multiplier circuits? Explain its working with a schematic diagram.	**07**
	(b)	Give the Marx circuit arrangement for multistage impulse generators. How is the basic arrangement modified to accommodate the wave time control resistances?	**07**
Q.2	**(a)**	Define the Townsend's first & second ionization co-efficient. Also derive the equation for second ionization co-efficient.	**07**
	(b)	Impulse generator has 12 capacitors of 0.12 µF and 200 kV rating .The wave front and the wave tail resistances are 1.25 kΩ and 4 kΩ respectively. If the load capacitance including that of the test object is 1000pF, find the wave front and wave tail times and the peak voltage of the impulse wave produced.	**07**
		OR	
	(b)	For a high voltage generator using Cockcroft-Walton circuit with 4 stages and peak input a.c voltage of 100 kV, 200 Hz, the load current of 4 mA and each stage capacitances of 0.02 µF, calculate the ripple voltage and voltage drop.	**07**
Q.3	**(a)**	Describe, with a neat sketch, the working of a Van de Graff generator. What are the factors that limit the maximum voltage obtained?	**07**
	(b)	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**
		OR	
Q.3	**(a)**	Explain the different electrical tests done on isolators and circuit breakers.	**07**
	(b)	What is Tesla coil? Draw the equivalent circuit and its output waveform. Also derive the equation of output voltage.	**07**
Q.4	**(a)**	Explain high voltage Schering Bridge for measurement of capacitance and tan δ of an insulator.	**07**
	(b)	State and explain Paschen's law with the help of characteristics curve.	**07**
		OR	
Q.4	**(a)**	Draw the layout of High voltage Laboratory & write the specifications of High voltage laboratory equipments.	**07**
	(b)	What is meant by Insulation Coordination? How are the protective device chosen for Optimal Insulation Level in power system?	**07**
Q.5	**(a)**	Give different circuits that produce impulse waves explaining clearly their relative merits and demerits.	**07**
	(b)	What are "Treeing" & "Tracking"? Explain clearly the two processes in solid dielectrics.	**07**
		OR	
Q.5	**(a)**	What is the principle of operation of a resonant transformer? How it is advantageous over the cascade connected transformers?	**07**
	(b)	Explain Purification & Breakdown Tests for Liquid Dielectric.	**07**

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