

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VI(NEW) – EXAMINATION – SUMMER 2019

Subject Code:2160904

Date:18/05/2019

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.

		MARKS
Q.1	(a) Define Townsend's first ionization coefficients. Obtain current growth equation due to first ionization.	03
	(b) Explain advantages and disadvantages of capacitance voltage Transformer with equivalent circuit.	04
	(c) Draw and explain Marx circuit and modified Marx circuit of multistage impulse generator.	07
Q.2	(a) Discuss how to measure ac voltage using sphere gap.	03
	(b) List advantages, disadvantages and applications of Van de Graff generator	04
	(c) Explain with neat diagram the principle & construction of an electrostatic voltmeter.	07
	OR	
	(c) What are treeing and tracking? Explain this two phenomenon in solid dielectrics.	07
Q.3	(a) Explain time lags for breakdown of gas.	03
	(b) Explain equivalent circuit of partial discharge.	04
	(c) A ten stage Cockcroft-Walton circuit has all capacitors of 0.06 μ F. The secondary voltage of the supply transformer is 100 kV at a frequency of 150 Hz. If the load current is 1mA determine: 1.Voltage Regulation, 2.The Ripple, 3. The optimum number of stages for maximum output voltage, 4.Maximum Output Voltage	07
	OR	
Q.3	(a) Explain breakdown test for Transformer oil.	03
	(b) Explain Trigatron gap.	04
	(c) What is Paschen's Law? How do you account for the minimum voltage for breakdown under a given 'p x d' condition?	07
Q.4	(a) What is surge arrester?	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.4	(a) Describe Test facility provided in high voltage laboratory.	03
	(b) Discuss Hall effect in Hall generator.	04
	(c) What is meant by insulation co-ordination? How are the protective devices chosen for optimal insulation level in a power system?	07
Q.5	(a) Discuss power frequency tests of insulator.	03
	(b) What is Finite Element Method? Brief it for solving the field problems	04
	(c) Explain High voltage Schering bridge for $\tan \delta$ and capacitance measurement of Insulators.	07

- Q.5**
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| (a) | Explain metal oxide lightning arrester. | 03 |
| (b) | Give comparison between uniform and non-uniform field. | 04 |
| (c) | Give classification of high voltage laboratory. | 07 |

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