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10EE73

Seventh Semester B.E. Degree Examination, Dec.2019/Jan.2020
High Voltage Engineering

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting atleast TWO questions from each part.***

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

PART – A

1 a. Explain the need for generation of very high voltages in the laboratory. **(06 Marks)**
b. What are the industrial applications of high voltages? **(08 Marks)**
c. Explain Townsand's theory of gas breakdown. Derive equation of current growth. **(06 Marks)**

2 a. Explain the streamer theory of breakdown in air and obtain the expression for smallest value of α. **(10 Marks)**
b. Explain the various theories that explain breakdown in commercial liquid dielectrics. **(10 Marks)**

3 a. Write short notes on:
(i) Electromechanical breakdown (ii) Thermal breakdown **(14 Marks)**
b. Explain time lags for breakdown of gas. **(06 Marks)**

4 Write short notes on:
(i) Cascaded transformer
(ii) Resonant transformer
(iii) Tesla coil. **(20 Marks)**

PART – B

5 a. Explain how impulse voltages are generated in laboratory using MARX circuit. **(10 Marks)**
b. What is a trigatron gap? Explain its functions and operation. **(10 Marks)**

6 a. With a neat sketch, explain the construction and working principle of electrostatic voltmeter. Bring out their advantages and disadvantages. **(10 Marks)**
b. Explain in detail about the sphere gap measurements and mention the factors affecting the measurements. **(10 Marks)**

7 a. Explain the simple and accurate method of measuring peak values of ac voltages as suggested by Chuff and Fortescue method. **(10 Marks)**
b. With the help of a neat sketch, explain the construction and principle of high voltage Schering bridge used for dielectric loss angle measurements. Derive the expression used. **(10 Marks)**

8 a. Explain with a neat diagram, the procedure for impulse testing of power transformer. **(08 Marks)**
b. Write short notes on:
(i) Testing of insulators
(ii) Testing of cables. **(12 Marks)**

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