Librarian
Learning Resource Centre
Acharya Institute & Technology

USN | | | | | | | | | | |

10EE73

Seventh Semester B.E. Degree Examination, Feb./Mar. 2022
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. What are the need for generating high voltage in laboratory? Mention advantage of transmitting high voltage. **(12 Marks)**

b. Explain with diagram working of electrostatic precipitator. **(08 Marks)**

2 a. Derive the equation for Townsend's first and second ionization coefficient what is the condition for spark to occur. **(10 Marks)**

b. Explain Paschen's law with breakdown voltage pd curve. **(05 Marks)**

c. A steady current 600μA flows through the plane electrodes separated by a distance of 0.5cm when a voltage of 10KV is applied. Determine townsend first ionization coefficient if a current of 60μA flows when the distance of separation is reduced to 0.1cm and field is kept constant at the previous value. **(05 Marks)**

3 a. Explain the following breakdown mechanism in solid :
i) Streamer breakdown ii) Electromechanical breakdown. **(10 Marks)**

b. Explain the various theories that explain breakdown in commercial liquid dielectric. **(10 Marks)**

4 a. What is cascaded transformer? Explain why cascading is done. Describe with neat diagram a three stage cascaded transformer. **(10 Marks)**

b. A 10 stage Crockraft – Walton circuit has all capacitor of 0.06μp. The secondary voltage of supply is 100KV at frequency of 150Hz. If the load current is 1mA. Determine :
i) Voltage regulation
ii) Ripple
iii) The optimum number of stage for maximum output voltage
iv) The maximum voltage. **(10 Marks)**

PART – B

5 a. Explain Marx circuit arrangement for multistage impulse generator. How a basic arrangement modified to accommodate the wave-time control resistance. **(10 Marks)**

b. A 12 stage impulse generator has capacitor each rated 0.3μF, 150KV capacitance of test specimen is 400pf. Determine the wave-front and wave-tail resistance to produce a 1.2/50μs impulse wave. **(05 Marks)**

c. How is the trigatron gap used for triggering impulse generator? **(05 Marks)**

6 a. With the help of neat sketch describe the working principle of klydonograph. **(07 Marks)**

b. Describe the Chubbfortes and method of measuring high voltage. **(06 Marks)**

c. Explain the factor influencing the sparkaover voltage of spheregap. **(07 Marks)**

7 a. Discuss the method of straight detection for locating partial discharge in electric equipment show partial discharge pattern. **(10 Marks)**

b. Explain how capacitance and tan δ can be measured using Schering bridge. **(10 Marks)**

8 a. Write short notes on Rogowsky's coil. **(05 Marks)**

b. Mention the different electrical test done on circuit breaker. **(08 Marks)**

c. Describe various electrical test done on transformer. **(07 Marks)**

* * * * *