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Roll No

EX-7004(1)-CBGS

B.E. VII Semester

Examination, December 2020

Choice Based Grading System (CBGS)

High Voltage Engineering

Time : Three Hours

Maximum Marks : 70

- Note:** i) Attempt any five questions.
ii) All questions carry equal marks.

1. a) What are the important factors which are considered in designing any high voltage system?
b) What are different theories which describe the Breakdown in liquid dielectric? Explain any one.
2. a) Explain the criteria for gaseous insulation breakdown based on Townsends theory with limitations.
b) State Paschen's law and Streamer's theory breakdown based on non uniform fields.
3. a) Describe Cockroft Walton circuit to produce DC high voltages.
b) Define the standard impulse voltage wave. Why is it necessary to standardize the impulse wave for testing?
4. a) Explain working principle of Multistage Marx Impulse Generator.

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- b) A ten stage Cockcroft-Walton circuit has capacitors of $0.06 \mu\text{f}$. The secondary voltage of transformer is 100kV at a frequency of 150Hz . If load current of 5mA , determine voltage regulation and optimum number of stages for maximum output voltage.
- 5. a) Define the front and tail times of an impulse wave. What are the tolerances allowed as per the specifications?
b) An 8-stage impulse generator has $0.12 \mu\text{f}$ capacitors rated for 167KV , what is its maximum discharge energy? If it has to produce a $1/50 \mu\text{sec.}$ wave form across a load capacitor of $15,000 \text{pf}$, find the value of the wave front and wave tail resistances.
- 6. a) Why is a Cockcroft-Walton circuit preferred for voltage multiplier circuits? Explain its working with a schematic diagram.
b) An impulse current generator is rated for 60KW sec. The parameters of the circuit are $C=53\mu\text{f}$, $L=1.47 \mu\text{H}$ and the dynamic resistance $=0.0156 \text{ohms}$. Determine the peak value of the current and the time-to-front and the time-to-tail of the current waveform.
- 7. 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?
b) Explain the different methods of high current measurements with their relative merits and demerits.
- 8. a) Write a short note on Testing of isolator
b) Write a short note on Testing of circuit breaker

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