Code: 9A02705 **R09**

B.Tech IV Year I Semester (R09) Supplementary Examinations June 2017

HIGH VOLTAGE ENGINEERING

(Electrical & Electronics Engineering)

Time: 3 hours Max. Marks: 70

Answer any FIVE questions

All questions carry equal marks

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1 (a) What is mean free path? Explain its importance.
(b) Discuss about various aspects of collision cross section.

2 (a) Define Townsend's first and second ionization coefficient. Derive the conditions for breakdown in a Townsend discharge.
(b) Describe various factors that influence breakdown in a gas.

3 (a) What is thermal breakdown in solid dielectrics and how is it practically more significant than other mechanisms?
(b) Explain the term composite dielectric and what are its properties.

4 (a) With a neat sketch, describe the working of a van de Graff generator.
(b) A Cockcroft-Walton type voltage multiplier has eight stages with capacitance all equal to 0.05 μF. The supply transformer secondary voltage is 125 kV at a frequency of 150 Hz. If the load current to be supplied is 5 mA, find: (i) The regulation. (ii) The percentage ripple. (iii) Optimum number of stages.

5 (a) What is trigatron gap? Explain its functions and operation.
(b) Enumerate the function of various components of multistage impulse generator.

6 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?

7 Explain the transformer ratio arm bridge for audio frequency range measurements. Discuss its merits and demerits over the other methods.

8 Explain the partial discharge tests on high voltage cables. How is a fault in the insulation located in this test?

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