

Duration: 3 Hrs**Total Marks :80**

N.B.:

- Question No. 1 is compulsory.
- Answer **any three** from the remaining five questions.
- Assume suitable data if necessary and justify the same.
- Figures to the right indicate the marks.
- Each question is for 20 marks.

- Q.1 a)** Discuss the various factors which affects the breakdown of gases (10)
- b)** Explain in detail “Avalanche Theory” for the electrical breakdown in gaseous? Discuss how this theory leads to Townsend’s mechanism of spark breakdown. State factors which control this process. (10)
- Q.2 a)** What is Thermal breakdown on solid dielectric? How is it practically more significant than other mechanisms? (10)
- b)** With neat diagram, explain the basic Principle of VAN-DE Graff’s generator. (10)
- Q.3 a)** Explain with reference to conduction and breakdown in commercial liquids. (10)
1. Suspended Particle Mechanism.
 2. Cavitation and Bubble Mechanism.
- b)** Why is Cock – Croft - Walton circuit preferred for voltage multiplier circuits? Explain its working with a schematic diagram. (10)
- Q.4 a)** Explain Marx Impulse generator circuit, (10)
1. Circuit diagram
 2. Construction
 3. Principle of operation
 4. Applications
- b)** With a neat circuit diagram, explain the principle of operation of an “Electrostatic Voltmeter”. Discuss its advantages and limitations for high voltage measurements. (10)
- Q5. a)** Explain different types of rectifier circuits for producing high DC voltage with suitable waveforms. (10)
- b)** What is partial discharge? Discuss the process of Partial Discharge (PD) in solid dielectrics and its effects on the breakdown strength of the dielectrics. Is the process of degradation of solid dielectrics reversible? Why? (10)
- Q.6 a)** What is cascaded transformer? Explain why cascading is done? With neat circuit diagram, describe a 3 – stage cascaded transformer for the generation of high A.C. voltages. (10)
- b)** Explain what is an operating duty cycle test on a Surge Diverter? Why is it more significant than other tests? (10)