

(3 Hours)

[Total Marks :80]

N. B.

- (1) Question No. 1 is compulsory.
- (2) Attempt any three questions out of remaining questions.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data if necessary.

1. Attempt any four :- .20
 - a) Explain the term 'Ionization' and hence explain different ionization processes with reference to breakdown in gases.
 - b) What is Partial discharge? Differentiate between internal and external partial discharges.
 - c) With a neat sketch explain Hall Generators for measurement of high currents.
 - d) Explain the phenomenon of 'tracking' in solid insulating materials under electrical stress. How it can be minimized.
 - e) Write a note on cable sample preparation before it is subjected to various tests.
2.
 - a) What is 'Cascaded Transformer'? Explain why cascading is necessary? With neat diagram, explain a three stage Cascaded transformer system. 10
 - b) Why is Cockcroft -Walton circuit preferred for voltage multiplier circuits? Explain its working with a schematic diagram. 10
3.
 - a) Define Townsend's first and second ionization constant. How the condition for breakdown is obtained in a Townsend's discharge? 10
 - b) Explain the various theories that explain breakdown in commercial liquid dielectrics. 10
4.
 - a) Describe the construction, principle of operation and application of 3-stage Marx generator circuit. 10
 - b) With a neat sketch, explain the working of a Van-De-Graff generator. What are the factors that limit the maximum output voltage obtained? 10
5.
 - a) Describe in brief various tests carried out on overhead line insulators. 10
 - b) 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? 10
6.
 - a) What are the various factors to be considered while designing a High Voltage Laboratory? 10
 - b) Explain with neat diagrams, why are capacitance voltage dividers preferred for high ac voltage measurements? 10