

6. According to the Paschen's Law, the breakdown voltage of a uniform field gap is
- (a) Directly proportional to the gas pressure and inversely proportional to the electrode gap
 - (b) Inversely proportional to the gas pressure and directly proportional to the electrode gap
 - (c) Directly proportional to the both electrode gap and gas pressure
 - (d) Inversely proportional to the both electrode gap and gas pressure
7. Surge diverters are
- (a) non-linear resistors in series with spark gaps which act as fast switches
 - (b) arc quenching devices
 - (c) shunt reactors to limit the voltage rise due to Ferranti effect
 - (d) over-voltages of power frequency harmonics
8. Impulse testing of transformers is done to determine the ability of
- (a) bushings to withstand vibrations
 - (b) insulation to withstand transient voltages
 - (c) windings to withstand voltage fluctuations
 - (d) all of the above
9. In wet flashover tests, the conductivity of water used is
- (a) $10 \pm 1.5 \mu$ Siemens
 - (b) $100 \pm 15 \mu$ Siemens at ambient temperature
 - (c) $45 \pm 10 \mu$ Siemens at room temperature
 - (d) $< 1.0 \mu$ Siemens at 27° C
10. In EHV and UHV system, ratio of BIL to SIL will be usually
- (a) Less than unity
 - (b) More than 1.5
 - (c) 1.5 to 2.0
 - (d) 1.2 to 1.5

PART - B (5 x 2 = 10 Marks)

- 11. Name the source of switching surges.
- 12. Define vacuum discharge.
- 13. What are electrostatic generators?
- 14. List the factors that are influencing the peak voltage measurement using sphere gap?
- 15. Differentiate type test and routine test.

PART - C (5 x 16 = 80 Marks)

16. (a) (i) Give the mathematical models for lightning discharges and explain them. (8)
(ii) Explain the different characteristics of lightning strokes. (8)

Or

- (b) Explain with suitable figures the principle and functioning of expulsion gaps and protector tubes. (16)

17. (a) Derive an expression for Townsend's criteria for breakdown of gaseous medium. (16)

Or

- (b) State the criteria for sparking potential and hence obtain the relation between sparking potential and (pd) values (Paschen's law). Discuss on the nature of variations of sparking potential with (pd) values. (16)

18. (a) How impulse currents are generated? Explain with the neat diagram. (16)

Or

- (b) What are the components of multistage impulse generator? Explain. (16)

19. (a) How do you measure the HVDC using sphere gap? State the factors influencing the measurements. (16)

Or

- (b) Describe the construction, principle of operation of a generating voltmeter and give its application. (16)

20. (a) Discuss the various test carried out in a circuit breaker and isolator switches at HV labs. (16)

Or

- (b) What is meant by insulation coordination? How are the protective devices chosen for optimal insulation level in a power system? (16)

