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B.E/ B.TECH (FULL TIME) DEGREE EXAMINATION APRIL/MAY 2012**Electrical and Electronics Engineering****EE 9352 High Voltage Engineering****VI Semester****Time: 3 Hrs****Answer all Questions****Max. Marks: 100****Part – A (10 X 2 = 20)**

1. What is a travelling wave?
2. What are the requirements of a ground wire for protecting power conductors against direct lightning stroke?
3. Mention the properties of composite dielectrics.
4. State : Townsend's primary ionization coefficient
5. A ten stage impulse generator has 0.250 μF Condenser wave front and wave tail resistances are 70 Ω and 2500 Ω respectively. If the load capacitance is 1.5nF, determine the wave front and wave tail times of the impulse wave.
6. Mention the advantages and disadvantages of series- parallel resonant circuit for generating high a.c. Voltages.
7. Define: Air density correction factor.
8. What are the problems associated with measurement of very high impulse voltages?
9. What are the tests to be carried out in bushings?
10. Define: Protective ratio

PART- B (5 X16 = 80)

- 11.a) i) Explain the method of impulse testing of high voltage transformers .[10]
ii) Describe the procedure for RI measurement with neat sketch. [6]

12.a)i) Explain the principle , functioning of expulsion gaps and protector tubes with suitable diagrams.

ii) Give the mathematical models for lightning discharges and explain them.

(OR)

12.b)i) Explain the different theories of charge formation in clouds.

ii) Explain the importance of switching overvoltage in EHV power systems.

13.a)i) Discuss about the various mechanisms of Vacuum breakdown.

ii) Discuss about the thermal and electro-mechanical breakdown phenomena of solid dielectric.

(OR)

13.b)i) Explain the various theories that explain breakdown in commercial liquid dielectrics.

ii) Discuss about the different types of "Time lag."

14.a)i) Derive an expression for ripple voltage of a multistage Cock craft Walton circuit.

ii) An impulse current generator has total capacitance of $12\mu\text{F}$, the charging voltage 125kV , the circuit inductance 3mH and the dynamic resistance 1Ω . Determine the peak current and wave shape of the wave.

(OR)

b.i) Describe the construction and principle of operation of a three stage cascade transformer.[8]

ii) Describe with neat diagram the principle of operation, application and limitations of Van de Graf Generator.[8]

15.a.i) Explain how a sphere gap can be used to measure the peak value of voltages.

ii) Discuss the advantages and limitations of an electrostatic voltmeter for high voltage measurement..

(OR)

15.b) Explain the principle and construction of a generating voltmeter for the measurement of high dc voltages. List out its advantages and disadvantages.
