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B.E / B.Tech (Full Time) Degree Examination April/May 2011

Electrical and Electronics Engineering

EE 9352 High Voltage Engineering

VI semester

Time: 3 Hours

Answer for ALL Questions

Max. Marks: 100

Part - A (2X 10 =20)

1. Define the reflection and refraction co- efficient.
2. What are the causes for switching and power frequency over voltages?
3. What is composite dielectric and what are its properties?
4. State; Paschen 's Law.
5. A 12 stage impulse generator has $0.124\mu\text{F}$ capacitors. The wave front and the wave tail resistances connected are 500 ohms and 480 ohms respectively. If the load capacitor is 1000pF . Find the front and tail times of the impulses wave produced.
6. Give the expression for ripple and regulation in voltage multiplier circuits.
7. What are the different types of resistive shunts used for impulse and high frequency measurements?
8. List out the essential parts of impulse current generator.
9. Classify the different types of tests to be conducted for cables and circuit breakers.
10. Define: 50% Flash over voltage.

Part B (5 X 16 = 80)

11. Explain the method of impulse testing of high voltage transformers .What is the procedure adopted for locating the failure.(16)

[P.T.O]

12.a)i. Explain the different theories of charge formation in clouds.(8)

ii. Explain the causes for power frequency over voltages in powers systems. (8)

(OR)

12. b) Explain the different methods employed for lightning protection of over head lines. (16)

13.a)i. Discuss about the various mechanisms of Vacuum breakdown.(6)

ii. Discuss about the thermal breakdown, treeing and tracking phenomena in solid dielectric material.(10)

(OR)

13.b)i. Explain the various theories that explain breakdown in commercial liquid dielectrics.(10)

ii. Discuss about the different types of "Time lag."(6)

14.a)i. A cock croft Walton type voltage multiplier has eight stages with capacitances all equal to $0.02\mu\text{F}$.the supply transformer secondary voltage is 125kV at a frequency of 100Hz.If the load to be supplied is 4.5 mA. Find a) the % of ripple b) the regulation and c) the optimum number of stages for minimum regulation or voltage drop. (10)

ii. Describe the working principle of a Van de Graff generator with a neat sketch. (6)

(OR)

14.b) i. Explain the working principle of Electrostatic generator for the generation of High DC voltage.(6)

ii. Explain the different schemes for cascade connection of transformers for producing very high ac voltages.(10)

15.a) Explain the principle and construction of an electrostatic voltmeter for very high voltages. What are the merits and demerits for high voltage a.c. measurements? (16)

(OR)

15.b) Explain how a sphere gap and trigatron gap arrangement can be used to measure the peak value of voltages.(16)
