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COLLEGE OF ENGNIEERING GUINDY, ANNA UNIVERSITY CHENNAI::25
B.E. (FULL TIME) DEGREE END SEMESTER EXAMINATIONS, MAY/JUNE 2013
ELECTRICAL AND ELECTRONICS ENGINEERING BRANCH
SIXTH SEMESTER – (REGULATIONS 2008)
EE 9352: HIGH VOLTAGE ENGINEERING

Time: 3 Hours Maximum Marks: 100

(Answer all Questions)

PART – A

10 x 2 = 20

1. What is the significance of Mean free path in gaseous breakdown?

2. Suggest the processes responsible for the formation of the vapour bubbles in liquid dielectrics.

3. How will a travelling wave behave in a line terminated with a Resistance equal to the surge impedance of the line?

4. How can we control overvoltages due to switching?

5. Resonant transformers are advantageous over the cascade connected transformers. Justify.

6. Define and draw a standard impulse voltages as per Indian standard.

7. Why potential dividers are always connected through delay cables to the oscilloscopes?

8. What are the requirements of an oscilloscope for high frequency measurements?

9. What is the significance of type test in High Voltage power apparatus?

10. Define the terms withstand voltage and creepage distance.

PART –B 5 x 16 = 80

11. With relevant theories explain the mechanism of Lightning overvoltage and hence explain protection scheme employed against therein. (16)

12. a) (i) Explain the different process of solid breakdown in practice. (10)
(ii) Discuss in detail how 'Stressed oil volume theory' explains breakdown in commercial liquid dielectrics. (6)

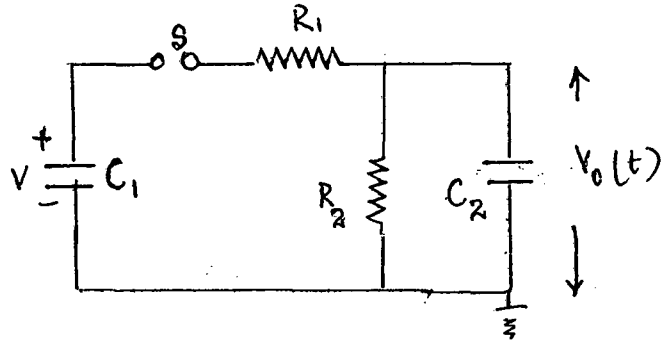
(OR)

b) Explain the different ionization process and thus derive the Paschen's Law for Gaseous dielectrics. (16)

13. a) Analyze a 3 stage Cockroft-Walton voltage multiplier circuit and obtain an expression for minimum ripple and maximum output. (16)

(OR)

b) (i) Derive an expression for $V_0(t)$ for the given circuit (12)



(ii) Suggest how the above circuit can be changed to generate 8/20 μ sec current wave form. (4)

14. a) What are the different techniques employed for measuring high DC voltages. Explain each method with relative merits and demerits. (16)

(OR)

b) (i) Explain how sphere gaps are used for peak voltage measurements. What are the factors affecting such measurements (10)

(ii) Explain how high currents can be measured in laboratories (6)

15. a) (i) Compare Type test and Routine test for High Voltage Power Apparatus (4)

(ii) Perform an Impulse voltage withstand test on a 11kV/433V distribution transformer as per IS 2026. (12)

(OR)

b) (i) Perform the dielectric test on a 22kV Epoxy resin Insulator (10)

(ii) What is the significance of wet power frequency voltage withstand test on Air-break Circuit breaker (6)