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Question Paper Code: 59303

B.E./B.Tech. DEGREE EXAMINATION, MAY 2018

Elective

Electrical and Electronics Engineering

15UEE903 HIGH VOLTAGE ENGINEERING

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer All Questions

PART A - (5 x 3= 15Marks)

1. Illustrate the Bewley's lattice diagram for reflection and transmission of wave on the line with two terminals? CO1- U
2. Distinguish between uniform and non-uniform field and give examples of each. CO2- U
3. Give the expression for optimum number of stages in a cock croft Walter voltage multiplier? CO3- U
4. List the general methods used for measurement of high frequency and impulse currents? CO4- U
5. Explain the terms disruptive discharge voltage, routine test and type test as per international standards. CO5- U

PART – C (5 x 14= 70Marks)

6. (a) Outline the causes and effects of switching and power frequency over voltages. Also explain the measures to be taken for the mitigation of effect during the occurrence of over voltages. CO1-Ana (14)

Or

- (b) Give a brief note on protection of transmission line using surge diverters. CO1 -Ana (14)

7. (a) Discuss Meek's theory of breakdown in gases under non-uniform fields. CO2 -U (14)
- Or
- (b) Explain clearly breakdown in non-uniform fields & corona discharges. CO2 -U (14)
8. (a) Describe the cascaded transformer connection to generate high alternating voltages. CO3- U (14)
- Or
- (b) Describe with neat diagram the principle of operation, advantages, limitations and applications of vande-graff generator. CO3- U (14)
9. (a) Explain generating voltmeter for measuring high DC voltage and mention its merits and demerits CO4-U (14)
- Or
- (b) Explain how a sphere gap can be used to measure the peak value of voltages? Also discuss the parameters and factors that influence such voltage measurement. CO4 -U (14)
10. (a) Explain in sequence the various high voltage test being carried out in a power transformer. CO5- U (14)
- Or
- (b) Discuss the various tests carried out in a surge diverters CO5- U (14)
- PART -- C (1 x 15 = 15 Marks)
11. (a) A Cockcroft-walton type voltage multiplier has eight stages with capacitances all equal to $0.05 \mu\text{F}$. The supply transformer secondary voltage is 125kV at a frequency of 50Hz. If the load current to be supplied is 5mA, evaluate (i) the percentage ripple, (ii) the regulation and the optimum number of stages for minimum regulation or voltage drop. CO3- U (15)
- Or
- (b) Explain the different theories of charge formation in clouds. CO1-U (15)