Total No. of Questions : 8]

SEAT No. : ____

P5143

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[5561]-589
B.E. (Electrical)
HIGH VOLTAGE ENGINEERING
(2015 Pattern) (Semester - II) (Elective - III)

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data, if necessary.***
5) ***Use of calculator is allowed.***

Q1) a) Explain following breakdown mechanism in solid insulating materials. **[8]**

i) Intrinsic breakdown

ii) Electromechanical breakdown

b) Explain the working of three cascade connected transformers used for generation of AC voltages. State its advantages and disadvantages also. **[8]**

c) Compare Townsend's theory and streamer mechanism of breakdown in gases. **[4]**

OR

Q2) a) Explain corona discharges for point plane electrode combination with positive and negative pulse application. **[8]**

b) A solid dielectric material with dielectric constant of 5.2 has void of thickness 2mm. The dielectric material thickness is 9 mm and voltage applied across it is 80 k V (rms). If void is filled with air and has dielectric strength of 30k V/cm (peak.) Find the voltage at which internal discharge can occur. **[4]**

c) Write a note on generation of high impulse voltage. **[8]**

P.T.O.

Q3) a) Explain how a sphere gap can be used to measure the peak value of voltages. What are the parameters and factors that influence such voltage measurement? **[10]**

b) With neat diagram explain CVT. Explain its advantages. **[8]**

OR

Q4) a) Explain with a neat sketch principle and working of electrostatic voltmeter. Write down its merits and demerits. **[10]**

b) With a suitable figure explain the working of generating voltmeter. State its advantages. **[8]**

Q5) a) Explain clearly the process of "Cloud to earth" and "Return" lightning stroke. State the characteristics of such stroke and their effect when they strike EHV AC installations or lines. **[8]**

b) Explain "insulation co-ordination". How are protective devices chosen for the optimal insulation level in power system. **[8]**

OR

Q6) a) Explain in details Reynold's and Mason's theory of charge formation in clouds. **[8]**

b) State and explain the causes of over voltage due to switching surges and system fault. **[8]**

Q7) a) List the different tests done on surge arresters? Mention the procedure for testing. **[8]**

b) Classify the different High voltage laboratories and give salient features of each of them.

OR

Q8) a) Explain the following terms as referred to high voltage testing: **[8]**

i) Withstand voltage.

ii) Flashover voltage.

iii) 50% flashover voltage.

iv) Wet and dry power frequency tests.

b) Describe earthing and shielding of high voltage laboratories. **[8]**

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