

Total No. of Questions : 8]

SEAT No. :

P5143

[Total No. of Pages : 2

[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]

