

Total No. of Questions : 10]

SEAT No. :

P3599

[Total No. of Pages : 2

[4959]-1074

B.E. (Electrical)

HIGH VOLTAGE ENGINEERING

(2012 Pattern) (Semester - II)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Solve Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8, Q9 or Q10.*
- 2) *Figures to the right indicate full marks.*
- 3) *Use of non programmable calculator is allowed.*
- 4) *Assume suitable data, if necessary.*

Q1) a) Explain Townsend's breakdown Criterion. **[5]**

b) What do you understand by 'intrinsic strength' of a solid dielectric? How does breakdown occur due to electrons in a solid dielectric? **[5]**

OR

Q2) a) Describe breakdown in non-uniform fields and corona discharge. Explain the concept of positive corona and negative corona. **[5]**

b) Explain suspended particle theory of breakdown in liquid dielectrics. **[5]**

Q3) a) Discuss time-lags for breakdown. Define statistical time lag and formative time lag. **[5]**

b) What are the mechanisms by which lightning strokes develop and induce overvoltages on overhead power lines? **[5]**

OR

Q4) Write short note on following : **[10]**

a) Thermal breakdown of solid insulating material.

b) What is a composite dielectric? Describe the mechanism of short term breakdown of composite insulation.

P.T.O.

- Q5)** a) Draw a neat schematic diagram of three stage cascade transformer. Explain the scheme for producing very high AC voltages. [8]
b) With circuit diagram, explain the series resonant circuit and parallel resonant circuit for generation of high AC voltage. [8]

OR

- Q6)** a) Explain use of Three electrode gap as a tripping control circuit for impulse voltage generation. [8]
b) Answer following with reference to Modified Marx circuit for generation of impulse voltage; [8]
i) Connection and working of Modified Marx circuit.
ii) The purpose of use of sphere gap unit in Max circuit
iii) Connection of capacitors during charging and discharging mode.

- Q7)** a) With neat diagram, write short note on the use of sphere gap unit for measurement of high voltage. State standard diameters of spheres, material of sphere. [8]
b) Draw a neat diagram showing electrostatic voltmeter. Discuss basic principle of operation of electrostatic voltmeter. [8]

OR

- Q8)** a) With neat diagram explain CVT. Explain its advantages also. [8]
b) Explain the use of electro-optical signal converter for measurement of high frequency AC current. [8]

- Q9)** a) Explain the type and routine test performed on following high voltage equipment [12]
i) Power Capacitor
ii) Surge Arrestor
b) Explain the classification of High Voltage laboratory. [6]

OR

- Q10)** a) What are various tests to be performed on bushing. [6]
b) Explain the testing of cables. [6]
c) Explain the safety measures and shielding of high voltage laboratory. [6]

