

Total No. of Questions : 8]

SEAT No. :

P3078

[5154]- 644

[Total No. of Pages : 2

B.E. (Electrical)

HIGH VOLTAGE ENGINEERING

(2012 Pattern) (Semester - II) (End Sem.) (Elective -III) (403149A)

Time :2½ Hours]

[Max. Marks :70

Instructions to candidates:

- 1) *Answer all questions.*
- 2) *Answer Q1 or Q2, Q3 or Q4,Q5 or Q6, Q7 or Q8.*
- 3) *Neat diagram must be drawn wherever necessary.*
- 4) *Figures to the right indicate full marks.*
- 5) *Assume Suitable data, if necessary.*
- 6) *Use of calculator is allowed.*

- Q1) a)** Derive Townsend's current growth equation in presence of primary and secondary ionization processes. State limitations of Townsend's theory. [7]
- b) Explain statistical method of insulation coordination. [6]
- c) Find power law dependence equation from following observation obtained while testing liquid dielectric material. [7]

Gap Distance (cm)	4	6	8	10
Breakdown voltage (kV)	88	135	165	212

OR

- Q2) a)** Explain streamer mechanism of breakdown. State its advantages and disadvantages. [7]
- b) Describe in detail Intrinsic breakdown in case of solid dielectric material. [6]
- c) With neat diagram explain mechanism of Lightning. [7]
- Q3) a)** Draw a neat diagram of 3 stage cascade transformer and explain its working. Also state its advantages and disadvantages. [8]
- b) Draw a neat sketch of Marx Circuit arrangement for multistage impulse generators. How is the basic arrangement modified to accommodate the wave time control resistances? [8]

OR

P.T.O.

- Q4)** a) With a neat diagram explain working of Tesla Coil. State its advantages and applications. [8]
- b) Explain the generation of High Impulse Current with a suitable diagram. Also describe its main parts. [8]

- Q5)** a) What is dielectric loss and dielectric constant? Explain the method of measurement of dielectric constant and loss factor. [9]
- b) An impulse generator has 8 stages with condenser rated for $0.16 \mu\text{F}$ and 125 kV. The load capacitor available is 1000 pF. Find the series resistance and damping resistance needed to produce $1.2/50 \mu\text{sec}$ impulse wave. What is the maximum output voltage of generator, if the charging voltage is 120 kV? [9]

OR

- Q6)** a) State the different methods of partial discharge measurement and explain any one in detail. [9]
- b) With suitable figure explain the working of generating voltmeter. Also state its advantages. [9]

- Q7)** a) Explain the different test carried on bushings in high voltage testing laboratory. [8]
- b) Classify the different High voltage laboratories and give salient features of each of them. [8]

OR

- Q8)** a) State and explain the different high voltage tests carried on surge arresters. [8]
- b) Explain the design, planning and layout of a typical High voltage laboratory. [8]

