

Total No. of Questions : 6]

SEAT No. :

P393

[Total No. of Pages : 2

BE/Insem/APR-47

B.E. (Electrical) (Semester - II)

HIGH VOLTAGE ENGINEERING

(2012 Pattern) (Elective - III)

Time : 1 Hour]

[Max. Marks : 30

Instructions to the candidates:

- 1) *Use of non programmable calculator is allowed.*
- 2) *Solve Q.1 or 2, Q.3 or 4 and Q.5 or 6.*
- 3) *Figures to the right indicate full marks.*
- 4) *Assume suitable data, if necessary.*

Unit - I

- Q1) a)** What is ionization? Explain ionization processes by collision and photo ionization. [6]
- b) Derive Townsend's current growth equation in presence of primary and secondary ionization coefficients. [4]

OR

- Q2) a)** Discuss time lags for breakdown. Define statistical time lag and formative time lag. [6]
- b) In an experiment in a certain gas it was found that the steady state current is 5.5×10^{-8} Amp at 8 kV at distance of 0.4 c.m. between the plane electrodes. Keeping the field constant and reducing the distance to 0.1 c.m. results in a current of 5.5×10^{-9} Amp. Calculate Townsend's primary ionization coefficient. [4]

Unit - II

- Q3) a)** Explain following breakdown phenomenon of liquid dielectric materials [6]
- i) Suspended particle theory.
 - ii) Cavitation an bubble theory.

P.T.O.

- b) In an experiments for determining the breakdown strength of transformer oil, the following observations were made. Determine the power law dependence between the gap spacing and applied voltage of the oil. [4]

Gap spacing (mm)	4	6	10	12
Breakdown voltage (KV)	90	140	210	255

OR

- Q4)** a) What is composite dielectrics? What are its properties? [6]
b) Breakdown due to treeing and tracking in solid dielectric material. [4]

Unit - III

- Q5)** a) State the reasons of occurrence of switching over-voltage. Explain the methods to minimize the switching over-voltage. [6]
b) Explain Simpson and Wilson theory of charge formation in clouds. [4]

OR

- Q6)** a) What is statistical approach of insulation co-ordination on high voltage power system and substation? [6]
b) Explain the development of lightening strokes. Also explain the terms ; Pilot streamer, Stepped leader, Dart leader. [4]

