

Total No. of Questions :6]

SEAT No. :

P82

[Total No. of Pages :2

APR - 18/ BE/ Insem. - 40

B.E. (Electrical)

HIGH VOLTAGE ENGINEERING

(2012 Pattern) (Semester - II) (Elective - III) (403149)

Time : 1 Hour]

[Max. Marks :30

Instructions to the candidates:

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

UNIT - 1

- Q1)** a) Define Townsends' primary and secondary ionization coefficients. How is the condition for breakdown obtained in Townsends' discharge? [6]
- b) Compare Townsends theory and Streamer mechanism of breakdown in gases. [4]

OR

- Q2)** a) Discuss time-lags for breakdown. Define statistical time lag and formative time lag. [6]
- b) A steady current of $400 \mu\text{A}$ flows through flat electrodes separated by distance of 5mm, when voltage of 10 kV is applied. Determine Townsends first ionization coefficient (α). If current of $50 \mu\text{A}$ flows when distance of separation is reduced to 1 mm and field is kept constant as previous, find Townsends second ionization coefficient. [4]

UNIT - 2

- Q3)** a) What is composite dielectrics. Explain the effect of multiple layers, thickness of layers and interfaces on the breakdown in composite dielectric material. [6]

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- b) Explain cavitations and bubble theory for liquid dielectric. [4]

OR

- Q4)** a) Explain Partial discharge (internal discharge) in case of solid dielectrics. [6]

- b) What type of impurities are found in liquid dielectric material? Explain the purification cycle of liquid dielectric material to remove impurities. [4]

UNIT - 3

- 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. [6]

- b) What is the function of lightning arrester? State different types of lightning arresters. [4]

OR

- Q6)** a) Explain statistical method of insulation coordination. [6]

- b) Explain Wilsons theory and Simpson theory of charge formation in clouds. [4]