

6E3110

Roll No. \_\_\_\_\_

Total No of Pages: **3**

**6E3110**

**B. Tech VI Sem. (Main / Back) Exam. May/June 2013**

**Electrical Engg.**

**6EE 2 High Voltage Engineering**

**Time: 3 Hours**

**Maximum Marks: 80**

**Min. Passing Marks: 24**

*Instructions to Candidates:*

*Attempt any **five questions**, selecting **one question** from **each unit**. All questions carry **equal marks**. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

*Units of quantities used/calculated must be stated clearly.*

*Use of following supporting material is permitted during examination.*

1. \_\_\_\_\_

2. \_\_\_\_\_

**UNIT – I**

Q1. (a) Discuss "Treeing and Tracking Breakdown" in solids. [8]

(b) Explain "cavitations and Bubble theory" in context with breakdown in liquids. [8]

**OR**

Q1. (a) Define Townsend's first and second ionization Coefficients. How is the condition for breakdown obtained in a Townsend discharge? [8]

(b) Explain the phenomena of electrical conduction in liquids. How does it differ from that in gases? [8]

## UNIT – II

- Q2. (a) Explain different schemes for cascade connection of transformers for producing very high AC Voltages. [8]
- (b) Give the Marx circuit arrangement for multistage impulse generators. [8]

### OR

- Q2. (a) Why is a Cockcroft – Walton circuit preferred for voltage multiplier circuit? Explain its working with schematic diagram. rtuonline.com [8]
- (b) Give the expression for ripple and regulation in voltage multiplier circuits. How are the ripple and regulation minimized? [8]

## UNIT – III

- Q3. (a) What are partial discharges and how are they detected under power frequency operating conditions? [8]
- (b) What are “broad band” and “narrow band” detectors? What is the sensitivity in each of the above detectors? [8]

### OR

- Q3. (a) Explain the high voltage Schering Bridge for the  $\tan \delta$  and capacitance measurement of insulators or bushings. [8]
- (b) The volume resistivity of a Bakelite piece was determined by using standard circular electrodes, a sensitive galvanometer and stabilized power supply. When the applied voltage was 1000V, the galvanometer deflection with the specimen was 3.2cm. When a standard resistance of  $R_s = 10\text{M}\Omega$  is used for calibration, the deflection was 33.30cm with a universal shunt ratio of 3,000. The diameter of the electrodes is 10cm, and the thickness of the specimen is 2mm. Find the volume resistivity. [8]

### UNIT – IV

- Q4. (a) What are the mechanism by which lighting strokes develop and induce over – voltage on overhead power lines? [8]
- (b) Explain the terms “attenuation and distortion” of travelling waves propagating on overhead lines. [8]

OR

Q4. Explain reflection and refraction of waves for following:

- (i) Open circuited line
- (ii) Short circuited line
- (iii) Line terminated through a resistance
- (iv) Line terminated through a capacitance.

[4x4=16]

### UNIT – V

Q5. Explain various types of lightning arresters in detail.

[16]

OR

Q5. Write short notes on the following: -

- (i) Coordination of insulation levels.
- (ii) Operation of ground wires.

[8+8=16]