

**Roll No. ....**

**Total Pages : 03**

**BT-7/M-20**

**37028**

**HIGH VOLTAGE ENGINEERING**

**EE-403E**

Time : Three Hours]

[Maximum Marks : 100

**Note** Attempt Five questions in all, selecting at least one question from each Unit.

**Unit I**

1. (a) Discuss the various factors which affect breakdown of gases. **10**
- (b) Define Townsend's first and second ionization coefficients. Explain the Townsend's criterion for a spark. **10**
2. (a) Explain the breakdown process in solid dielectric due to internal discharge. Write down various equations and curves related to it. **10**
- (b) Explain thermal breakdown in solid dielectrics. How is this mechanism more significant than the other mechanisms? **10**

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## Unit II

3. (a) Explain with neat sketches Cockroft-Walton voltage multiplier circuit. Explain clearly its operation, when the circuit is (i) unloaded (ii) loaded. **10**
- (b) Describe three-stage cascaded transformer with its circuit diagram. **10**
4. (a) What are the requirements of a sphere gap for the measurements of high voltages? Discuss the disadvantages of sphere gap for measurements. **10**
- (b) Draw Chubb-Fortes cure circuit for the measurement of peak value of AC voltage. Discuss its advantages over other methods. **10**

## Unit III

5. (a) Differentiate between Type test and Routine tests. Briefly write about the high voltage tests conducted on an insulator. **10**
- (b) Explain the procedure for performing the impulse test of transformer. **10**
6. (a) What do you understand by Insulation coordination? Explain the construction of a Volt-time curve. **10**

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- (b) Explain surge diverter with its operation and characteristics. **10**

#### **Unit IV**

- 7.** (a) Explain the advantages of EHVAC transmission. What are the challenges associated with EHVAC transmission. **10**
- (b) What do you mean by bundled conductor? Explain its use and benefits. **10**
- 8.** (a) What is corona loss? Explain various factors and voltages associated with it. **10**
- (b) Draw the layout of a converter station and explain the role of various equipments at converter station. **10**