

Roll No.

Total Pages : 03

BT-7/M-20

37198

HIGH VOLTAGE ENGINEERING

EE-405N

Time : Three Hours]

[Maximum Marks : 75

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

Unit I

1. (a) Define and explain Townsend's first and second ionization coefficients. **7**
- (b) Explain the cavity breakdown and electroconvection breakdown in liquid dielectric. **8**
2. (a) Explain the thermal breakdown in solid dielectric. Derive an expression for critical electric field and show that the field is independent of the critical temperature of the dielectric. **10**
- (b) What is time lag ? Discuss its components and the factor which affect these components. **5**

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Unit II

3. (a) With the help of neat circuit diagram, explain the working of Cockroft-Walton voltage multiplier circuit under unloaded and loaded conditions.
- (b) With the help of a neat circuit diagram, discuss the multistage impulse generator. **5**
4. (a) With the help of schematic circuit diagram, explain the working of electrostatic voltmeter. Discuss its merit and demerits for high voltage measurements. **10**
- (b) What are problems associated with measurements of very high impulse voltage ? Explain, how these can be taken care of during measurements.

Unit III

5. (a) Describe and explain the arrangements of insulator for performing various test. Also explain the procedure of testing for it. **8**
- (b) List out and discuss the various tests carried out on power capacitor. **7**

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6. (a) With the help of a neat sketch, explain the different theories of charge generation and separation in lightning phenomenon. **10**
- (b) Discuss the volt-time curve characteristics. Explain its significance in power system studies.

Unit IV

7. (a) Discuss the resistances effect on EHV transmission lines and also explain skin effect. **8**
- (b) Explain the different configurations and properties of bundled conductors. **7**
8. (a) With the help of neat sketches, discuss different types of DC links in HVDC transmission system.
- (b) Explain the differences in power control in HVDC and HVAC system and explain the necessity of power control in an HVDC Link. **8**