4. (a) What is treeing and tracking ? Explain clearly the two processes of solid dielectrics. **7½**

(b) What is electroconvection ? Explain liquid breakdown based on electroconvection. **7½**

Unit III

5. (a) Define ripple voltage. Show that the ripple voltage in a rectifier circuit depends upon the load current and the circuit parameters. **7½**

(b) Explain with neat diagram the principle of operation of (i) series (ii) parallel resonant circuits for generating high AC voltages. Compare their performance. **7½**

6. (a) Describe with neat diagram the principle of operation, application and limitation of Vandegraff generator. **7½**

(b) Draw a typical impulse current generator circuit and explain its operation and application. **7½**

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H-25

B. Tech. EXAMINATION, Dec. 2018

(Eighth Semester)

(B. Scheme) (Re-appear Only)

(EE)

EE432B

EHV AC/DC

Time : 3 *Hours*] [*Maximum Marks :* 75

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

Unit I

1. (a) Define Townsend's first and second ionization coefficients. Explain the Townsend's criteria for spark. **7½**

(b) In a certain experiment relating to study of breakdown in gases, the ratio of current obtained to initial current was 1.20, 1.80 and 2.25 for gap distances of 1.0, 3.0 and 4.0 cm respectively, if E/p was constant at 160 V/cm-torr and pressure 0.1 torr, calculate the value of α and γ. **7½**

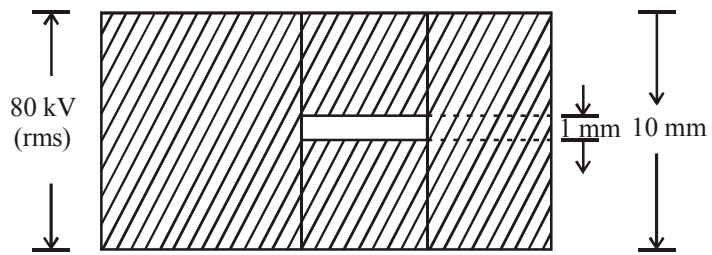
2. (a) Explain the mechanism of development of anode and cathode streamers and explain how these lead to breakdown. **7½**

(b) Explain the experiment set-up for the measurement of pre-breakdown currents in gases. **7½**

Unit II

3. (a) State various processes which lead to formation of bubbles in liquid dielectrics and explain clearly cavity breakdown mechanism in liquid dielectrics. **7½**

(b) A solid dielectric specimen of dielectric constant of 4.0 shown in the figure has internal void of thickness 1 mm. The specimen is 1 cm thick and is subjected to a voltage of 80 kV (rms). If the void is filled with air and if the breakdown strength of air can be taken as 30 kV (peak)/cm, find the voltage at which an internal discharge can occur. **7½**



Unit IV

7. (a) Describe the construction of a uniform field spark gap and discuss its advantages and diadvantags for high voltage measurements. **7½**

(b) Explain the working of a voltage doubler circuit with the help of a neat circuit diagram. **7½**

8. (a) An electrostatic voltmeter has two parallel plates. The movable plate is 10 cm in diameter. With 10 kV between the plates the pull is 5×10^{-3} N. Determine the change in capacitance for a movement of 1 mm of movable plate. **7½**

(b) Explain briefly impulse testing of power transformer. **7½**

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