Unit IV

7. (a) Discuss the phenomenon of corona in A.C. EHV line. Discuss factor which affect corona loss. **7**

(b) For a 400 kV line calculate minimum surface voltage gradient on centre and outer phases in horizontal conjunction at maximum operating voltage of 420 kV. Rms, line to line. The other dimensions are H = 12, S = 15 Mm, N = 2, r = 0.0159, B = .45 m. **8**

8. Explain the following in detail :

(a) Lightning arrester and their characteristics

(b) Lightning stroke mechanism

(c) Insulator flashover with withstand voltage. **15**

CC-45

M. Tech. EXAMINATION, Dec. 2017

(Third Semester)

(Main & Re-appear)

EE(PS)

MPS-631-B

HIGH VOLTAGE ENGG.

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) What are the cathode and anode streamer ? Explain the mechanism of their formation and development loading to breakdown. **10**

(b) If the breakdown occurred when the gap distance was increased to 0.9 cm, what is the value of secondary ionization coefficient ? **5**

2. (a) Determine the breakdown voltage for air gaps of 2 mm and 5 mm length under uniform field and standard atmospheric conditions. Also find the voltage if atmospheric pressure is 750 mm of Hg and temperature 35ºC. **10**

(b) What are treeing and tracking ? Explain clearly the two processes in solid dielectrics. **5**

Unit II

3. Explain the neat sketches cockroft-walton voltage multiplier circuit. Also derive its operation under loaded and unloaded condition. **15**

4. Give different circuits that produces impulse waves explaining clearly their merits and demerits. **15**

Unit III

5. Draw a neat schematic diagram of a generating voltmeter and explain its principle of operation and also discuss its application and limitations. **15**

6. (a) What are the different power frequency tests done on insulators ? Mention the procedure for testing. **8**

(b) A 20 KV, 50 Hz schering bridge has a standard capacitance of 106 μF. In a test on a Bakelite sheet balance was obtained with a capacitance of 0.35 μF in parallel with non-inductive resistance of 318 ohm. The non-inductive resistance remaining arm of the bridge being 130 ohm. Determine the equivalent resistance, capacitance, PF. **7**