Roll No. ....

24434

B. Tech. 7th Semester (EE)

Examination – May, 2019

HIGH VOLTAGE ENGINEERING

Paper : EE-442-F

Time : Three Hours]   [Maximum Marks : 100

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

Note : Question No. **1** is *compulsory*. attempt *one* question from each of four Section.

1. (a) What are the difference between switching surge and impulse voltage ? $2 \times 10 = 20$

   (b) What is the principle behind the operation of generating voltmeter ?

   (c) Define Intrinsic strength of a solid dielectric.

   (d) What is the need for generating high impulse current ?

   (e) Explain the role of Bureau of Indian standards in hv testing.

   (f) What are atmospheric correction factors ? Mention their significance.

   (g) How the stray effect is reduced in resistive shunt type measurement ?

   (h) What is BIL ?

   (i) How is Impulse voltage withstand test conducted ?

   (j) Define Isokeraunic level.

SECTION – A

2. (a) Describe recent trends in high voltage transmission using suitable examples.   10

   (b) Explain breakdown mechanism involving in solid dielectric breakdown.   10

3. (a) Define Townsend's first and second eonization coefficients. How is the condition far breakdown obtained in Townsend's discharge.   10

(b) Explain various mechanism of Vaccum Breakdown. 10

SECTION – B

4. (a) Find surface voltage gradient for a conductor with N. no. of sub conductors. 10

(b) Derive expression for electrostatic field of sphere Gap. 10

5. (a) A point charge $Q = 10^{-6}$ coulomb (1 μc) is kept on the surface of a conducting sphere of radius r= 1 cm , which can be considered as a point charge located at the centre of the sphere. Calculate field strength and potential at a distance of 0.5 cm from the surface of the sphere. Also find capacitance of the sphere. Given that $c_R = 1$ 10

(b) Derive expression for electrostatic field of line charges. 10

SECTION – C

6. (a) Define corona and corona loss. Explain sources and effects of corona. 10

(b) How corona pulses can be generated ? Mention few of its properties. 10

7. (a) Explain different methods employed for lighting protection of overhead lines. 10

(b) Explain operation of expulsion gap lightning arrestor along with its advantages and disadvantages. 10

SECTION – D

8. (a) Why is grounding very important in a h. V. laboratory ? Describe a typical grounding system used. 10

(b) Explain methods of switching surge generation from Impulse generator. 10

9. (a) Explain with diagrams, different types of rectifier circuits for producing high d. c. Voltages. 10

(b) Describe, the working of Vande Graff generator, with the help of neat sketch. 10

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