

D 90283

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Name .....

Reg. No. ....

**SEVENTH SEMESTER B.TECH. (ENGINEERING) [09 SCHEME] DEGREE  
EXAMINATION, NOVEMBER 2015**

**EE/PTEE 09 706 L13—HIGH VOLTAGE ENGINEERING**

Time : Three Hours

Maximum : 70 Marks

**Part A**

*Answer all questions.*

1. What are the drawbacks of Townsend's mechanism ?
2. What is vacuum ? How it is classified and list the mechanisms describing breakdown in vacuum.
3. What are the basic principles of an electrostatic machine and show that mechanical power required to move the belt is converted into electrical power ?
4. What are the different types of errors that occur in impulse voltage measurement by potential divider method ?
5. What do you mean by reflection in transmission line ? What is the coefficient of reflection in a short circuited transmission line ?

(5 × 2 = 10 marks)

**Part B**

*Answer any four questions.*

6. What are properties of composite dielectric ? How the charge accumulation and partial discharges contribute ageing and failure of insulation ?
7. What is Tesla coil ? Explain the construction and working principle of Tesla coil and how it is related to the term resonance.
8. What are the requirements of an oscillograph for impulse and high frequency measurements in high voltage test circuits ?
9. What is Hall Effect ? How Hall Effect generator is used for measurement of high d.c. current ?
10. What do you mean by partial discharge ? Explain with figure how a fault in transformer winding can be detected and located using partial discharge technique.
11. Explain the circuit for measurement of RIV in a transmission line.

(4 × 5 = 20 marks)

**Part C**

12. What are anode and cathode streamers ? Explain the mechanism of their formation and development leading to breakdown.

(10 marks)

Or

Turn over

13. What do you mean by commercial liquids ? Explain the various mechanisms related to the breakdown in commercial liquid dielectrics.

(10 marks)

14. Explain about voltage multiplier circuits for the generation of high d.c. voltages with neat schematic diagram. Why one of the method is preferred to the other ?

(10 marks)

*Or*

15. With the help of a simple circuit explain how high impulse currents are generated. Draw waveform and derive the expression for front time and tail time.

(10 marks)

16. What is CVT ? Explain with phasor diagram how it is used for voltage measurements in power system.

(10 marks)

*Or*

17. What is the working principle of electrostatic voltmeter ? Explain the construction and how it is used for measurement of high voltages ?

(10 marks)

18. Explain the modification to be made to the Schering bridge for the following situation :—

(a) High dissipation factor test objects.

(b) One end of the test object to be grounded.

(10 marks)

*Or*

19. What are the different causes of power frequency over voltages in EHV system ? Explain each with necessary circuits and equation.

(10 marks)

[4 × 10 = 40 marks]