

Code No: **R41022**

**R10**

**Set No. 1**

**IV B.Tech I Semester Supplementary Examinations, Oct/Nov - 2018**

**HIGH VOLTAGE ENGINEERING**

**(Electrical and Electronics Engineering)**

**Time: 3 hours**

**Max. Marks: 75**

**Answer any FIVE Questions  
All Questions carry equal marks**

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- 1 a) Briefly explain the steps involved and outline of finite element analysis. [8]  
b) Discuss about surge voltage and their distribution and control in high voltage power apparatus. [7]
- 2 a) Define Townsend's first and second ionization coefficients. Explain Townsend's criterion for spark breakdown. [8]  
b) State Pachen's law and explain about its Pachen's curve. [7]
- 3 a) Explain the phenomena of Intrinsic breakdown in solid dielectrics. [8]  
b) Explain applications of solid insulating materials used in different parts of transformers and rotating machines. [7]
- 4 a) Explain with diagrams, different types of rectifier circuits for producing high DC voltages. [8]  
b) Explain the method of controlled tripping of impulse generator. [7]
- 5 a) What are the methods used for measurement of High DC voltage. Explain them briefly. [8]  
b) Draw Chubb-Fortescue Circuit for measurement of peak value of AC voltages discuss its advantages over other methods. [7]
- 6 a) Explain the measurement of dielectric constant and loss factor in electrical apparatus. [7]  
b) Following measurements are made to determine the dielectric constant and complex permittivity of a test specimen: the air capacitance of the electrode system is 50 pF, the capacitance and loss angle of the electrodes with specimen are 190 pF and 0.0085 respectively. Calculate the values of dielectric constant and complex permittivity of the test specimen. [8]
- 7 a) Explain, with neat schematic diagrams, measurement of radio interference in fields and laboratories. [8]  
b) What is the significance of power factor tests and partial discharge tests on bushings? How are they conducted in laboratory? [7]
- 8 Discuss industrial applications of following with respect to high voltage engineering: (i) Electro static precipitator (ii) Electro Static copying [15]