Code No: **R41022** **R10** **Set No. 1**

IV B.Tech I Semester Supplementary Examinations, October/November - 2017

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) What is a surge voltage? What is the difference between a power frequency voltage and a surge voltage? What are the various sources that produce surge voltages? [7]

b) Discuss briefly the Charge Simulation Method for solving the field problems and estimating the potential distribution. [8]

2 a) State Pachen's law and explain Pachen's curve. Derive an expression for minimum 'pd' value of Pachen's curve from first principles. [9]

b) Explain suspended particle theory in commercial liquids. [6]

3 a) Explain the phenomena of thermal breakdown in solid dielectrics. [7]

b) Discuss the applications of various solid insulating materials used in cables and capacitors. [8]

4 a) Draw a typical impulse current generator circuit and explain its operation and application. [8]

b) Determine ripple voltage and regulation of a 10 stage Cockroft-Walton type DC voltage multiplier circuit having stage capacitance = 0.01 μF, supply voltage = 100 kV at a frequency of 400 Hz and a load Current = 10 mA. [7]

5 a) What is a mixed potential divider? How is it used for impulse voltage measurements? [8]

b) What are the requirements of a sphere gap for measurement of high voltages? Discuss the advantages of sphere gap for measurements. [7]

6 a) Explain how the volume resistivity of a solid dielectric is determined. [7]

b) Explain the high voltage Schering Bridge for measurement of the tan δ and capacitance of high voltage equipment. [8]

7 a) Explain, with a schematic diagram, one method of measuring RIV of transmission line hardware. [7]

b) Explain the method of impulse testing of high voltage transformers. What is the procedure adopted for locating the failure? [8]

8 Discuss the applications of the following in high voltage engineering:
(i) Electro static coating (ii) Electro Static separator [15]