Code No: **RT42022B** **R13** **Set No. 1**

IV B.Tech II Semester Regular/Supplementary Examinations, April - 2018

HIGH VOLTAGE ENGINEERING

(Electrical and Electronics Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any THREE questions from Part-B

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PART–A *(22 Marks)*

1. a) Define uniform and non-uniform electric field. [3]
   b) Explain breakdown procedure in pure liquids. [4]
   c) Write the specifications of impulse voltage and current wave forms. [4]
   d) Explain about peak voltmeters. [4]
   e) Write a short note on the use of an Oscilloscope as a PD measuring device. [4]
   f) Explain about the 50% dry impulse flash over test. [3]

PART–B *(3x16 = 48 Marks)*

2. a) Discuss about the finite difference method for electric field computation. [8]
   b) Compare different numerical methods used in field computation. [8]

3. a) Explain difference between photo-ionization and photo-electric emission? [8]
   b) Explain short term and long term breakdown mechanisms that occur in a composite solid dielectrics? [8]

4. a) Explain tripping and control of impulse generators. [8]
   b) Explain with diagrams different types of rectifier circuits to produce high D.C Voltages. [8]

5. a) What are the different types of resistive shunts used for impulse current measurements? Discuss their characteristics and limitation. [8]
   b) Describe generating voltmeter used for measuring high d.c voltages. How does it compare with a potential divider for measuring high dc currents. [8]

6. a) The lossless standard capacitor used in high voltage Schering Bridge has a value 100 pF. In a certain measurement, the other arms of the bridge at balance are (i) a resistance of 641 ohms and (ii) a capacitance of 0.052 μF in parallel with a resistance of 2500 ohms. Determine capacitance and loss tangent of the specimen at 50 Hz. [8]
   b) How partial discharges are measured using straight detectors? [8]

7. a) What is significance of impulse tests? Briefly explain impulse testing of insulators. [8]
   b) Mention different electrical tests done on isolators. [8]