

Code No: R41022

R10**Set No. 1**

IV B.Tech I Semester Supplementary Examinations, March/April - 2016

HIGH VOLTAGE ENGINEERING

(Electrical and Electronics Engineering)

Time: 3 hours**Max. Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks

- 1 a) Define Field factor? How does it vary in simple geometries? [8]
b) Explain the Governing equations in Finite Element Method for solving the electric fields. [7]
- 2 a) Describe the current growth phenomenon in a gas subjected to uniform electric fields. [8]
b) Explain how the phenomena of electrical conduction in liquids differ from that in gases. [7]
- 3 a) Define Intrinsic strength. Explain Intrinsic breakdown mechanism in solid dielectrics. [8]
b) Briefly explain the insulation arrangement in transformer indicating the insulating materials chosen for insulation. [7]
- 4 a) With neat diagrams, explain the rectifier circuits for producing high DC voltages. [8]
b) A voltage doubler circuit has $C_1 = C_2 = 0.01 \mu\text{F}$ and is supplied from a voltage source of $V = 100 \sin 314t$ kV. If the DC output current is to be 4 mA, calculate the output voltage and the ripple. [7]
- 5 a) Explain the principle of operation of generating voltmeter for measuring high DC voltages. [8]
b) Discuss the characteristics and limitations of resistive shunts used for impulse current measurements. [7]
- 6 a) Briefly explain the measuring circuits for measurement of resistance. [8]
b) With neat sketch, explain the partial discharge detection in power cables. [7]
- 7 a) Define i) Withstand voltage ii) Disruptive discharge voltage
 iii) Flashover voltage iv) Creepage distance [8]
b) Explain the partial discharge tests on high voltage cables. [7]
- 8 a) Explain the working principle of Electrostatic precipitator. [8]
b) Mention the industrial applications of high energy pulsed power generator. [7]