

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**

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- 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  $V = 100 \sin 314t \text{ kV}$ . 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]