

Code No: **R41022****R10****Set No. 1****IV B.Tech I Semester Supplementary Examinations, February - 2019****HIGH VOLTAGE ENGINEERING****(Electrical and Electronics Engineering)****Time: 3 hours****Max. Marks: 75****Answer any FIVE Questions**
All Questions carry equal marks

- 1 Discuss the different numerical methods available for estimation of electric field distribution in dielectric media. [15]
- 2 a) Derive the condition for Townsend's breakdown and also state the limitations of it. [7]
b) Explain the cavitation and bubble theory in commercial liquids. [8]
- 3 a) Briefly discuss the intrinsic breakdown in solid insulating materials. [7]
b) Enumerate the applications of insulating materials in circuit breakers and power capacitors. [8]
- 4 a) Draw the equivalent circuit of a 3-stage Cascade transformer and determine the expression for short circuit impedance of the transformer. Hence deduce an expression for the short circuit impedance of an n-stage Cascade transformer. [9]
b) Discuss the method used to control tripping of impulse generator. [6]
- 5 a) What is Ragowskii Coil? Explain with a neat diagram, its principle of operation for measurement of high impulse currents. [8]
b) Explain the use of capacitance voltage transformer used for high voltage measurements in power systems. [7]
- 6 a) Explain how balanced detection method used for locating partial discharge in electrical equipment. [8]
b) The volume resistivity of a Bakelite piece was determined by using standard circular electrodes, a sensitive galvanometer, and a stabilized power supply. When the applied voltage was 1000 V, the galvanometer deflection with the specimen was 3.2 cm. When a standard resistance $R_s = 10 \text{ M}\Omega$ is used for calibration, the deflection was 33.30 cm with a universal shunt ratio of 3,000. The diameter of the electrodes is 10 cm, and the thickness of the specimen is 2 mm. Find the volume resistivity. [7]
- 7 a) Why is synthetic testing advantageous over the other testing methods for short circuit tests? Give the layout for synthetic testing of circuit breakers. [8]
b) Describe the partial discharge methods used in high voltage cables. [7]
- 8 Mention the applications of the following
(a) Electrostatic coating (b) Electrostatic copying. [15]