Code: R7410207

R7

IV B.Tech I Semester (R07) Supplementary Examinations, May 2012
HIGH VOLTAGE ENGINEERING
(Electrical & Electronics Engineering)

Time: 3 hours Max Marks: 80

Answer any FIVE questions
All questions carry equal marks

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1. (a) Give the temperature classification for solid insulating materials. Why that classification is not done for liquids and gases.
   (b) What is finite element method? Give the outline of this method for solving the field problems.

2. Explain various theories that explain breakdown is commercial liquid dielectrics.

3. (a) What are the special features of epoxy resin insulation.
   (b) Describe the mechanism of long term breakdown of composite insulation.

4. (a) Describe the working of van de Graft generator with neat diagram. What are the factors that limit the maximum voltage obtained?
   (b) A 12-stage impulse generator has 0.126 μF capacitors. The wave front and wave tail resistances are 800 ohms and 5000 ohms respectively. If the load capacitor in 1000 PF. Find the front and fail times of the impulse wave produced.

5. (a) Explain the principle and construction of an generating voltmeter of very high voltages what are its merits and demerits for high voltage AC measurements.
   (b) A resistance divides of 1400 cv (impulse) has a high voltage arm of 16 kilo-ohms and a low voltage arm consisting 16 members of 250 ohms, 2 watt resistors is parallel. The divider is connected to a CRO through a cable of surge impendence 75 ohms and is terminated at the other end through a 75 ohm resistor. Calculate the exact divider ratio.

6. (a) What is surge arrestor? Explain its function as a shunt protective device.
   (b) A transmission line of surge impedance 500 ohms is connected to a cable of surge impedance 60 ohms at the other end. If a surge of 500 kv travels along the line to the junction point. Find the voltage build up at the junction.

7. (a) Describe moles arrangement for measuring high dissipation factors in the low frequency range.
   (b) The volume of resistivity of a Bakelite piece was determined by using standard circular electrodes, a resistive galvanometer, and a stabilized power supply. When the applied voltage was 1000 v, the galvanometer deflection was 3.2 cm. When a standard resistance of Rs = 10 M ohm is used for calibration, the deflection was 33.30 cm with a universal shunt ratio of 3000. The diameter of the electrodes is 10 cm, and the thickness of the specimen in 2mm. Find the volume resistivity.

8. (a) What are the different power frequency tests done on insulators? Mention the procedure for testing.
   (b) What is the significance of impulse test? Briefly explain the impulse testing of insulators.

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