

Exam. Code: 0937
Sub. Code: 6681

2063

B.E. (Electrical and Electronics Engineering)
Seventh Semester
EE-711: Electrical Insulation in Power Apparatus and Systems

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Unit.

x-x-x

I. Attempt the following:-

- a) What are the special features of high voltage rectifier valves?
- b) What are the requirements of sphere gap for measurement of high voltages?
- c) Write advantages and limitations of nano-dielectrics.
- d) Explain the insulating materials used in high voltage power cables.
- e) Explain the factors responsible for breakdown in gases. (5x2)

UNIT - I

- II. a) How is lossy dielectric represented? Explain how an ideal capacitor in parallel with a resistor can represent a lossy dielectric over a wide frequency range.
b) What do you understand by the term intrinsic strength of solid dielectrics? Is it possible to experimentally measure the intrinsic strength? (2x5)
- III. What is thermal breakdown in solid dielectrics? How is it practically more significance than other mechanism? Also explain suspended particle theory for liquid dielectrics. (10)
- IV. What are the differences between (a) Townsend discharges (b) Streamer discharges (c) Leader discharges. Describe briefly the main characteristics of each and the conditions under which each phenomena occurs. (10)

P.T.O.

(2)

UNIT - II

- V. a) What is the importance of sheath in a cable? Where does the maximum electric stress occur? Indicate it through a neat diagram.
b) How are the front and tail times controlled in impulse generator circuits. (2x5)
- VI. a) Explain the term basic impulse level. How are the protective devices chosen for optimal insulation in a power system?
b) Explain the term (i) withstand voltage (ii) Flash-over voltage (iii) 50% flashover voltage (iv) wet and dry power frequency tests as referred to high voltage testing. (2x5)
- VII. Describe with a neat sketch, the working of a Van de Graff generator. What are the factor that limits the maximum voltage obtained. Also explain partial discharges in an insulation system. (10)

x-x-x