

14/12/22 (E)

Exam. Code: 0937
Sub. Code: 6681

2122

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 do you mean by electron emission due to positive ion impact?
- b) Describe the factors that influences the breakdown in liquids.
- c) Which types of insulating materials are used in power cables and why?
- d) How are the wave front and wave tail times are controlled in impulse generator circuits.
- e) What do you mean by partial discharge test of transformes. (5x2)

UNIT - I

- II. a) What do you mean by ionization process and draw the arrangement for study of Townsend's discharge?
b) How do avalanche give rise to an electrical breakdown in case of Townsend's types of discharge. (2x5)
- III. a) What is Paschen's law? Explain with a neat diagram. How do you account for the minimum voltage for breakdown under a given pxd condition.
b) What will be the breakdown strength of air for small gaps (1mm) and large gaps (20cm) under uniform field conditions and standard atmospheric conditions. (2x5)
- IV. Explain the phenomena of electrical conduction in liquids. How does it differ from that in gases? Explain stressed oil volume theory. How does it explain breakdown in large volume of commercial liquid dielectrics. (10)

P.T.O.

(2)

UNIT - II

- V. a) With a neat diagram explain the functioning of the Marx circuit for multistage impulse generator.
b) An impulse generator has 8 stages with each capacitor rated for $0.16 \mu\text{F}$ and 125 kV. The load capacitor is 1000 pF. Find value of front and tail resistance to produce 1.2/50 μs waveform. (2x5)
- VI. a) Explain different schemes for cascade connection of transformers for producing very high voltages.
b) Write a note on capacitance voltage transformer. (2x5)
- VII. Draw Chubb-Fortescue circuit for measurement of peak value of ac voltage. Discuss its advantages over other methods. Explain the principles of operation of an electrostatic generator. (10)

x-x-x