Exam.Code:0937
Sub. Code: 6992

2021

B.E. (Electrical and Electronics Engineering)

Seventh Semester

EE-711: Electrical Insulation in Power Apparition and Systems

Time allowed: 3 Hours Max. Marks: 50

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

x-x-x

I. Attempt the following:-

a) Explain the term 'electron attachment'. What do you mean by optimization of electrode configuration? What is the procedure to control electric field intensity in high voltage equipment?

b) Discuss the various factors which affect breakdown of gases and liquids?

c) What is Paschen's law? How do you account for the minimum voltage for breakdown under a given 'p x d' condition?

d) What do you understand by "intrinsic strength' of a solid dielectric?

e) What are the special features of high voltages rectifier valves? (5x2)

UNIT – I

II. a) What are the properties that make plastics more suitable as insulating materials? What are the special features of epoxy resin insulation?

b) State and explain Paschen Law. Derive the expression for $(pd)_{min}$ and V_{bmin}. Assume A=12, B=365, and $\gamma = 0.02$ for air. Determine $(pd)_{min}$ and V_{bmin}. (2x5)

III. a) Derive the expression for critical electric field and show that the field is independent of the critical temperature of the dielectric?

b) How the ripple voltage in a rectifier circuit depends upon the load current and the circuit parameters? (2x5)

IV. Explain the application of oil in power apparatus and discuss its function with reference to circuit breaker. Explain the various theories that explain breakdown in commercial liquid dielectrics. (10)

P.T.O.

UNIT – II

V. Describe, with a neat sketch, the working of a Van de Graft generator. Explain the principle of operation of an electrostatic generator. Also explain the limitations and application of Van de Graf generator? (10)

VI. a) Explain the different schemes for cascade connection of transformers for producing very high a.c. voltages.

b) What will the breakdown strength of air be for small gaps (1 mm) and large gaps (20 cm) under uniform field conditions and standard atmospheric conditions? (2x5)

VII. Write note on following:-

a) Ageing Mechanisms

b) New Advanced techniques in diagnosis and monitoring (2x5)

x-x-x