B.E. ELECTRICAL ENGINEERING FOURTH YEAR FIRST SEMESTER EXAMINATION, 2019

HIGH VOLATGE TECHNIQUE - I

Time: Three hours   Full Marks: 100

(50 marks for each part)
Use separate answer script for each part.

Part – I
Answer any three questions.
Two marks are reserved for neat and well organized answers.

1.a)   Explain the breakdown of commercial liquid due to I) a liquid globule and II)   6+10
suspended particles.

2.a)   Discuss the thermal breakdown of solid dielectric.   12

2.b)   Explain the delays that occur during breakdown of a gaseous dielectric after the   4
application of voltage.

3.a)   Comment on the development of partial discharge in solid insulating material.   12

3.b)   'Yield' is higher in insulators than in metals – justify.   4

4.   Discuss (I) stepped ionization of gaseous dielectric and (ii) Use of SF_6 as a gaseous   6+10
dielectric.

5.   Write short notes on the following: 8+8
  i)   Effect of placing a barrier in a gaseous dielectric between two
          electrodes in non – uniform field.
  ii)   Breakdown in vacuum.

Ex/EE/T/414B/2019

BACHELOR OF ENGINEERING IN

ELECTRICAL ENGINEERING EXAMINATION, 2019

(4th Year, 1st Semester)

HIGH VOLTAGE TECHNIQUE I

Time: Three Hours

Full Marks: 100

(50 marks for each part)

Use a separate Answer-script for each Part

PART-II

Answer *any three* questions

Two marks are reserved for neat and well organized answer script

1. How the presence of a spherical dielectric particle affects uniform field distribution? Derive suitable expressions in support of your justification. {CO3}   16

2. Explain a method to solve for unknown node potential in axi-symmetric system with equal nodal distance. What happens when the node is on the axis of symmetry? {CO2}   8+8

3. a) How electric field computation is done by Charge Simulation Method (CSM) in multi-dielectric media? {CO2}   8

   b) What are the factors that affects the accuracy in CSM? How the accuracy can be checked? {CO2}   8

4. a) Discuss how Finite Element Method is able to determine the unknown potential in a system within an electric field. {CO2}   8

   b) Derive the Finite Element Equations in Two Dimensional Fields. {CO2}   8

5. Briefly describe the stress distribution in a high voltage system. With proper illustrations, show how stress control can be achieved in (i) circuit breakers, (ii) post insulators and (iii) bushings. {CO4}   16

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