B.E. ELECTRICAL ENGINEERING 2ND YEAR 1st SEMESTER EXAM 2019(Old)
ELECTRICAL ENGINEERING MATERIALS

Time : 3 Hrs

Full Marks : 100
(50 per Part)

Part – I
Use Separate Answer scripts for each part.

Answer any three (3×16).
Two (02) marks reserved for neat and well organized answers.
All questions are of 08 marks.

1. (a) Deduce and discuss Curie-Weiss law for ferromagnetic material. What are paramagnetic and ferromagnetic Curie points?
   (b) What are hard magnetic materials? How are they characterized? Discuss their usage in electrical machines.

2. (a) Explain Magnetostriction for ferromagnetic materials.
   (b) Explain Ferrimagnetism in magnetic materials. What are ferrites? What are their usages?

3. (a) Classify magnetic materials based on the presence of permanent magnet dipole moments. Draw and explain susceptibility versus temperature characteristics in each case
   (b) Discuss susceptibility vs temperature characteristics for different types of magnetic materials.

4. (a) Explain critical field and critical current density of superconductors. Also explain Meissner Effect.
   (b) Explain in brief different types of fuse and their usage.

5. (a) Deduce Joule's law of electrical heating from Drude model of electrical conduction.
   (a) Silsbee's rule for Superconductivity.

Ex/EE/T/212/2019 (OLD)

BACHELOR OF ENGINEERING IN ELECTRICAL ENGINEERING EXAMINATION, 2019

(2nd Year, 1st Semester, Old Syllabus)

ELECTRICAL ENGINEERING MATERIALS

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 neatness and well organized answer script

1. a) State some of the limitations of the "Simple Theory of Hydrogen Atom". Show that total energy of electron in Bohr's Hydrogen atom is inversely proportional to n^2 where the symbol is having usual meaning.   12

   b) Briefly explain "Nuclear Binding Energy" vs. "Mass Defect".   4

2. a) Discuss about (i) volume resistivity and (ii) dielectric dissipation factor of insulating material.   10

   b) The insulation resistance of 100m cable was 750MΩ at 30°C. The insulating material of the cable is such that an increase in 20°C is required for reducing the insulation resistance to half the value at 30°C. What will be the insulation resistance of 50m of the cable at 70°C?   6

3. a) Explain insulators, semiconductors and conductors with the help of band theory of solids.   10

   b) Write a note on stable interatomic distance in the formation of a matter.   6

4. What is synthetic resin? Discuss about a synthetic resin with respect to (i) Manufacturing Process, (ii) Molecular Formula, (iii) Properties and (iv) Applications.   16

5. Write short notes on any two of the following: 8×2

   (i) Stable Interatomic Distance
   (ii) Mica and Micanites
   (iii) Cross linked polyethylene (XLPE)

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