PVP 14

Code: EE1T5 / EE2T6RS

I B.Tech - I Semester – Regular / Supplementary Examinations
December - 2016

ELECTRICAL ENGINEERING MATERIALS
(ELECTRICAL AND ELECTRONICS ENGINEERING)

Duration: 3 hours Max. Marks: 70

PART – A

Answer ***all*** the questions. All questions carry equal marks

11 x 2 = 22 M

1.

a) Define electrical conductivity.
b) List the different types of solders.
c) What do you mean by doping in semiconductor?
d) Explain what is meant by fuse current?
e) Define the term electric dipole moment.
f) What is meant by ferroelectric materials?
g) Give the properties of mineral oil used for dielectrical apparatus.
h) Difference between thermosetting and thermoplastic polymer insulators.
i) Explain the term hard directions of magnetization.
j) What are ferrites?
k) Give the properties of soldering materials.

PART – B

Answer any ***THREE*** questions. All questions carry equal marks. 3 x 16 = 48 M

2. a) Explain different properties of materials. 8 M

   b) Two coils A and B connected in series have resistances of 600Ω and 300Ω and temperature co-efficient of 0.1% and 0.4% respectively at 20 ^{0}C. Find the resistance of the combination at a temperature of 50 ^{0}C. What is the effective temperature coefficient of combination? 8 M

3. a) Explain why the electrical conductivity of a semiconductor usually increases while that of a metal decreases with increasing temperature. What are the applications of semiconductor materials? 8 M

   b) How can high resistance materials be classified for different uses in electrical engineering practice? Give the names, composition and characteristics of two such materials. 8 M

4. a) What is meant by term Polarization? Explain electronic, Ionic, Di-Polar polarization. Derive an expression for the Lorentz field in a solid dielectric. 8 M

b) What are piezoelectric materials and their applications? Compare Piezoelectricity and Ferro electricity. 8 M

5. a) What are thermoplastic and thermosetting types of insulating materials? Name any two thermoplastic materials and discuss their electrical characteristics. 8 M

b) Give the classification of Gaseous insulators based on dielectric strength. List few different types of Gaseous insulators along with their main property and application. 8 M

6. a) What is silicon iron? For what purpose is it used and why? Give some properties of permanent magnetic materials. 8 M

b) Calculate the energy loss per hour by hysteresis in 50 kg iron core which is subjected to a sinusoidal flux alternating at 50 c/s. The hysteresis loop for the core has an area of 150 cm^2, when plotted to a scale of 1 cm = 0.008 Wb /m^2, 1 cm = 20 AT/cm. 8 M