

**B TECH**  
**(SEM-III) THEORY EXAMINATION 2018-19**  
**ELECTRICAL & ELECTRONICS ENGINEERING MATERIALS**

Time : 3 Hours

Max. Marks : 70

Note : In case of numerical problem assume data wherever not provided.

**SECTION – A****1. . Attempt all of the following questions:****7 X 2 = 14**

- (a) What is the function of insulating liquids?
- (b) Write characteristics of the semiconductor.
- (c) Discuss the properties of good dielectric materials.
- (d) What is the effect of moisture on insulation?
- (e) What are ferroelectric materials?
- (f) What are the general properties of conductors?
- (g) Name the metals and alloys for making fuse.

**SECTION – B****2. Attempt any three of the following questions:****3X7 = 21**

- (a) Distinguish clearly between soft and hard magnetic materials. Discuss their applications.
- (b) What is ionic polarization of dielectric materials? Discuss the phenomenon of polarization in solid dielectric.
- (c) What are the requirements of transformer oil? How is the dielectric strength of transformer oil ensured?
- (d) is the function of a fuse in an electric circuit? Explain briefly the different type of fuse unit with suitable diagram.
- (e) Explain the silicon wafers, integration technique and large and very large-scale integration technique.

**SECTION – C****3. Attempt any one part.****1 x 7 = 7**

- (a) Give the classification of insulating materials, according to temperature. Write example according to their temperature.
- (b) State and explain the losses which occur in magnetic materials when subjected to an alternating flux.

**4. Attempt any one part.****1x7=7**

- (a) Explain the followings materials used in electrical applications.
  - (i) Electric carbon materials.
  - (ii) Thermocouple materials.
  - (iii) Electric contact materials
- (b) What do you understand by diamagnetic, paramagnetic and ferromagnetic materials? Give three examples of each case.

**5. Attempt any one part.****1 x 7 = 7**

- (a) Explain the factor affecting the resistivity of electrical materials. The resistance of tungsten bulb is 144 ohm under normal working conditions. Find the temperature in degree assuming (i) cold resistance of bulb at 20 °C is 10 Ω, and (ii) average

temperature co-efficient for tungsten wire at  $20^{\circ}\text{C}$  as  $5 \times 10^{-3}$ .

(b) What are stranded conductors? Explain the different types material used in transmission line.

**6. Attempt any one part.**

**1 x 7 = 7**

(a) Discuss how the insulating material is classified. Write an account of mica based insulating materials.

(b) What is a semiconductor? Name the various semiconductor materials. What is the difference between N type and P type semiconductors how are they produced?

**7. Attempt any one part.**

**1 x 7 = 7**

(a) Explain the Galvanization process of a material in details with block diagram. Write advantages and its applications.

(b) Explain the major difference between conductors, semiconductors and insulators. Give typical value of conductivity for a conductor, a semiconductor and an insulator.

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