

**B.Tech. – VIEP – ELECTRICAL ENGINEERING
(BTELVI)**

00073 **Term-End Examination
December, 2018**

**BIEE-013 : ELECTRICAL AND ELECTRONICS
ENGINEERING MATERIALS**

Time : 3 hours

Maximum Marks : 70

Note : *Attempt any five questions. All questions carry equal marks. Use of scientific calculator is allowed.*

1. (a) Name the different types of bondings in solids and briefly discuss the characteristics of each bond. 7
- (b) Explain how X-ray diffraction is useful for crystal analysis. Hence, obtain Bragg's law. 7
2. (a) Derive the expression for electrical conductivity of a metal. How is it affected by temperature and alloying ? 7
- (b) Differentiate between intrinsic and extrinsic semiconductors. Why are semiconductors made extrinsic ? 7

3. (a) Calculate the volume of an FCC unit cell in terms of atomic radius, R. Show that the atomic packing factor of an FCC unit cell is more than that of BCC. 10
- (b) Explain the Drift and Diffusion currents. 4
4. Draw and explain the magnetic hysteresis loop for hard and soft magnets. 14
5. (a) Distinguish between ferromagnetic and anti-ferromagnetic materials with suitable examples. 6
- (b) Discuss the various uses of ferrite. 4
- (c) How do you determine the temperature for hot working of a metal ? 4
6. (a) What are the properties and applications of electrical conducting and insulating materials ? 7
- (b) Explain the various types of 'ageing of a permanent magnet'. 7
7. Write short notes on any **two** of the following : $2 \times 7 = 14$
- (a) Losses in magnetic materials
- (b) Crystal growth
- (c) Magnetoresistance effect and magnetoresistance co-efficient