[3 Hours] **[Total Marks : 80]**

Please check whether you have got the right question paper.

N.B:
1. **Question No. 1** is **compulsory**.
2. Attempt **any three** questions from remaining **five** questions.
3. **Figures** to the **right** indicate **full marks**.
4. **Illustrate** answers with **neat sketches** wherever **required**.
5. Assume suitable **data** wherever **required** and **state them clearly**.

1. a) Define and explain DeBroglie's wavelength. **(05)**

b) Differentiate between edge dislocation and screw dislocation. **(05)**

c) Explain opacity and translucency in insulators. **(05)**

d) What are refractories? Explain their properties and applications. **(05)**

2. a) What is Creep? Explain its mechanism and the factors affecting it in materials. **(10)**

b) Explain the mechanism and factors influencing corrosion in metals. **(10)**

3. a) Discuss the properties and applications of ceramics. **(10)**

b) What are crystal imperfections? Explain the different types of point imperfections in crystals with the help of neat sketches. **(10)**

4. a) What is superconductivity? Explain Type I and Type II superconductors in detail. Discuss the applications of superconductors. **(10)**

b) Explain in detail the factors affecting selection of materials for equipments in chemical industries. **(10)**

5. a) Draw and explain in detail the iron – iron carbide phase diagram. Mention the different phases and explain the phase transformation reactions involved. **(10)**

b) Explain band model of conductivity in solid materials. **(10)**

6. a) Explain elastic deformation and plastic deformation in detail. **(10)**

b) What is ferromagnetism? Compare it with paramagnetism and diamagnetism. **(10)**
