

Q.P. Code : 27538

[Time: 3 Hours]

[Marks: 80]

Please check whether you have got the right question paper.

- N.B:
1. Questions 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.

- Q.1 A.** Explain band model of conductivity in solid materials. **05**
B. Differentiate between edge dislocation and screw dislocation. **05**
C. Define and explain Debroglie's wavelength. **05**
D. Explain what is ferromagnetism and antiferromagnetism. **05**
- Q.2 A.** Explain the phenomenon of superconductivity. Explain its types and applications in detail. **10**
B. What are crystal imperfections? Explain the different types of point imperfections in crystals with the help of neat sketches. **10**
- Q.3.A.** Explain the mechanism of plastic deformation by slip and by twinning with the help of neat sketches. **10**
B. Discuss the properties and application of ceramics. **10**
- Q.4.A.** What is creep ? Explain its mechanism and the factors affecting it in materials. **10**
B. Explain in detail fiber reinforced composites with respect to : **10**
(i) Matrix material
(ii) Fibers.
- Q.5.A.** Explain the mechanism and factors influencing corrosion in metals. **10**
B. Explain ductile fracture and brittle fracture of materials in detail. **10**
- Q.6.A.** Derive Schrodinger wave equation and explain its physical significance. **10**
B. Explain factors used for selecting materials for process equipment . **10**
