

SE - Sem - IV (Chem.)
SE (Chem) - Sem IV (CBGS)
Material Science Engg.
MSE

04/6/14

QP Code : NP-19809

(3 Hours)

34

[Total Marks : 80

- N. B. : (1) Question No. 1 is compulsory.
(2) Attempt any four questions out of remaining six questions.
(3) Draw diagram wherever you necessary.
(4) Figures to right indicate full marks.

1. Write short notes on following :- 20
- (a) Heisenberg's uncertainty principle
 - (b) De Broglie's wave length
 - (c) Opacity, transiucency in glass
 - (d) Polymer alloys
2. (a) What is superconductivity? Explain type I and type II superconductors in detail. Write applications of superconductors. 10
- (b) Explain mechanism of electrical conduction in metals and semiconductors by using energy band model of conduction. 10
3. (a) Explain in detail iron-iron carbide phase diagram. Mension different solid phases involved. Explain the different types of steels in brief. 10
- (b) Explain plastic deformation of metals by slip mechanism. Explain any one metal strengthening method in brief. 10
4. (a) What are polymer blends? Explain any two polymer blends with respect to (i) composition (ii) properties (iii) applications. 10
- (b) Explain fiber reinforced plastic composites in detail with respect to (i) matrix material (ii) fibers. 10
5. (a) Explain mechanism of corrosion in metals and factors affecting it. 10
- (b) What is fatigue to metals? Explain factors affecting fatigue strength of metal? What basic structural changes occur in ductile metal in fatigue process? 10
6. (a) Explain factors used for selecting materials for process equipments. 10
- (b) Explain following crystal defects. 10
- (i) Line defects
 - (ii) Point defects.