S.E - IV sem — Chem

31/5/16

THADOMAL SHAHANI ENGINEERING COLLEGE ★ BANDRA, MUMBAI-50 ★ 31 MAY 20

SE/IV/CBGS/CHEM./MSE

QP Code: 573201

(3 Hours) [Total Marks :80

Material Sc. Engg. (32)

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) State and explain heisenberg's uncertainty principie. 5
(b) Differentiate between edge dislocation and screw dislocation. 5
(c) Explain what is ferromagnetism and antiferromagnetism. 5
(d) What are refractories? Explain their properties and applications. 5

2. (a) What is superconductivity? Explain Type I and Type II superconductors in detail. 10
Discuss the applications of superconductors. 10
(b) Explain the mechanism of plastic deformation by slip and by twinning with the help of neat sketches.

3. (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 mechanism of electrical conduction in solids by using energy band model of conductivity. 10

4. (a) What is corrosion? Explain the mechanism and factors influencing corrosion in metals. 10
(b) What is creep? Explain what are creep curves. Explain the types of mechanism of creep with the help of neat sketches. 10

5. (a) Explain in detail the factors affecting selection of materials for equipments in chemical industries. 10
(b) Explain in detail fiber reinforced composites with respect to 10
(i) Matrix material (ii) Fibers.

6. (a) What are crystal imperfections? Explain the different types of point imperfections in crystals with the help of neat sketches. 10
(b) Explain the following:- 10
(i) Opacity and translucency in insulators,
(ii) Properties and applications of ceramics.