[03 – 2210]

II/IV B.E. DEGREE EXAMINATION

Mechanical Engineering

Second Semester

MATERIAL SCIENCE

(Common with Dual Degree Programme in Mechanical Engineering, Metallurgy, Marine and Naval Architecture)

(Effective from the admitted batch of 2006–2007)

Time : Three hours Maximum : 70 marks

Question No. 1 is compulsory.

Answer any FOUR questions from the remaining.

All questions carry equal marks.

Answer to question No. 1 must be at one place.

Assume suitable missing data wherever necessary.

1. Write one or two sentences about :

   (a) Crystal plane

   (b) Point defect

   (c) Slip

(d) Lever rule

(e) Eutectic reaction

(f) Martensite

(g) Martempering

2. (a) Give the classification of crystal systems?

(b) Explain types of dislocations with neat sketches.

3. (a) Draw Iron-iron carbide phase diagram.

(b) Explain eutectic and eutectoid reactions of Iron-iron carbide system.

4. (a) Explain Annealing treatment.

(b) Discuss Carburizing process in detail.

5. (a) What are the limitations of plane carbon steels?

(b) Explain the effect of alloying elements in steels.

6. (a) Explain the fabrication methods of composite materials.

(b) Explain about the ceramic reinforced composites.

7. (a) Explain liquid penetrant and magnetic particle testing.

(b) Explain ultrasonic testing in detail.

8. (a) Explain various types of cast irons with their applications.

(b) Give the compositions and applications of various types of Aluminium alloys.