AU/IP/ME-402

B.E. IV Semester

Examination, June 2013

Matrerial Science & Metallurgy

Time : Three Hours

Maximum Marks : 70/100

Note: Attempt any one question from each unit.

Unit - I

1. a) Explain with the help of suitable sketches the various types of inter molecular bands.

   b) What is meant by the term 'refractory'? Describe its properties. Explain the difference between acid and basic refractories?

OR

2. a) What do you mean by 'Miller Indices'? Explain the procedure for finding Miller Indices.

   b) Explain the process of manufacturing pig iron in a blast furnace with the help of a neat sketch.

Unit - II

3. a) Explain with simple sketches the following :-

   i) Edge dislocation ii) Screw dislocation

   b) Explain recovery, recrystallization and grain growth.

OR

4. a) Explain various point defects with neat sketches.

   b) How fatigue fracture is initiated? Explain the mechanism of fatigue failure.

Unit - III

5. a) Explain Hume Rothery rules as applied to the formation of solid solution.

   b) Describe the solidification of a pure metal showing how the lattice structure and grain boundaries are formed.

OR

6. a) Explain Gibb's phase rule.

   b) Explain lever rule. What are its applications?

Unit - IV

7. a) Explain T.T.T. diagram.

   b) How does 'cyariding' differ from 'liquid carbonizing.

OR

8. a) Discuss the major defects in steel due to faulty heat treatment.

   b) Explain briefly Martempering and Austempering.

Unit - V

9. a) Explain various methods of preparation of metal powder.

   b) Write composition, properties and uses of the following:

   i) Gun Metal ii) Babbitt

OR

10. Write short notes on any three of the following:

    i) Thermoplastics and Thermosetting plastics

    ii) F.R.P

    iii) Mechanism of creep

    iv) Fatigue failures of a material