

Roll No

MMMD - 103
M.E./M.Tech., I Semester
Examination, December 2015
Material Science

Time : Three Hours

Maximum Marks : 70

Note : Attempt any five questions.

1. a) Define crystal structures. Write its various types in detail.
b) Explain role of imperfections in materials properties.
2. a) Explain various types of bonds observed in materials with examples.
b) Explain with example Miller indices, direction and plane indices.
3. a) Explain dislocations in metals. How they influence properties of materials.
b) What is meaning of work hardening? What are various ways in which work hardening can be performed?
4. a) What is creep in materials? What are factors influence creep occurrence in a material? Give examples in which this phenomenon frequently observed.
b) Draw and explain creep curve with mechanism involved in each stage.

5. a) Why heat treatment perform on mechanical components? What are various methods of heat treatment? How they are different from each other?
b) Write and explain various types of annealing methods with specific applications.
6. a) What are ceramic materials? How they are different from metals? Write their specific properties.
b) Explain various types of ceramic materials used in engineering applications with examples.
7. a) What are polymer materials? Explain their specific properties.
b) Write various types of polymer materials and compare them.
8. a) Explain electron theory of metals with example.
b) Explain elasticity and thermo-elastic behavior of materials.
