

1) People



B.E / B.Tech (Full Time) DEGREE END SEMESTER EXAMINATIONS, NOV-DEC2013

MATERIALS SCIENCE AND ENGINEERING BRANCH

THIRD SEMESTER - (REGULATION 2008)

23

ML 9204 – MATERIALS STRUCTURE AND PROPERTIES

Time: 3 hr

Max. Mark: 100

PART- A (10X2 = 20 Mark)

1. State an example for Perovskite structure and draw the structure.
2. Why metallic bonds are non-directional, unlike covalent bonds?
3. State the type of point defects in ionic crystals.
4. Which among the two kind of reaction is faster and why?: eutectic and eutectoid
5. What nature of certain alloys makes them heat treatable?
6. What do you mean by Matthiessen's rule?
7. Give an example for material that has Spinel structure and draw the structure.
8. What is responsible for formability of kaolinite clay?
9. List the different type of defects in polymer.
10. What is the different between deformation of elastomer and metal?

PART- B (5 X16 = 80 Mark)

11. (a) (i) List some of the application of polymers in biomedical application. (4)
(ii) Brief on any TWO types of thermosetting polymer and thermoplastic polymer. (12)
12. (a) (i) Compare and contrast the various types of bond and their characteristics properties with suitable examples.
(OR)
(b) (i) Brief on the type of interstitial sites and role in ionic solids and alloys formation.
13. (a) (i) Based on Iron–Iron carbide phase diagram brief on the various invariant reactions and their typical microstructure. (12)
(ii) Apply phase rule on A_{cm} and eutectoid point and comment on it. (4)
(OR)
(b) (i) Critically discuss the movement of dislocation in context of mechanical deformation. (8)
(ii) Explain the principle of zone refining. (8)

14. (a) Brief on the classification of steels based on their composition and their typical microstructure and applications.

(OR)

(b) Write short notes on the following with respect to their composition, crystal structure and properties:

- (i) Tungsten carbide (5)
- (ii) Nichrome and Kanthal (6)
- (iii) Tool steel (5)

15. (a) (i) On basis of crystal structure, state the reasons contributing to brittle and hard nature of ceramics. (8)

(ii) List the differences between an alloy and composite. (8)

(OR)

(b) Brief on polymer based composite reinforcement with particulates and fibres with suitable example and brief on their properties and application