

(DME 216)

B. Tech. DEGREE EXAMINATION, MAY - 2015

(Examination at the end of Second Year)

MECHANICAL ENGINEERING

Paper - VI : Material Science & Metallurgy

Time : 3 Hours

Maximum Marks : 75

Answer question No.1 compulsory

(15)

Answer ONE question from each unit

(4 × 15 = 60)

1) Write briefly about the following:

- a) Slip plane.
- b) Strain hardening.
- c) Space Lattice.
- d) Composite materials.
- e) Tool steel.
- f) Cementite.
- g) Eutectoid reaction.
- h) Cast Iron.
- i) Sintering of metal powders.
- j) Grain refinement.
- k) Aluminium.
- l) High speed steel.
- m) Stiffness.
- n) Coordination Number of B.C.C.
- o) Hard magnetic materials.

UNIT - I

- 2) a) Calculate the packing factor for BCC unit cell.
b) With neat sketches discuss different types of crystal Imperfections.

OR

- 3) a) Draw and explain peritective system.
b) What is eutectic reaction? Explain with neat structure the solidification of hypoeutectic alloy.

UNIT – II

- 4) Draw and explain Iron-Iron carbide diagram.

OR

- 5) Explain Normalising treatment with
a) Definition.
b) Mechanism.
c) Properties modification.

UNIT - III

- 6) a) Explain Elastic and anelastic behavior of materials.
b) Explain the mechanism of strain hardening.

OR

- 7) a) What is reinforcement? Explain the fibre reinforced composite materials.
b) Explain the advantages and limitations of Composite materials.

UNIT – IV

- 8) a) Explain dia, para and Ferro magnetism with examples.
b) Explain the temperature dependency of dielectric constant.

OR

- 9) a) Elaborate the applications of powder metallurgy.
b) Explain about Aluminium alloys giving its types and their applications.

