Printed Pages : 3

ME-303

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : **140306**

Roll No.

B. Tech.

(SEM. III) (ODD SEM.) THEORY EXAMINATION, 2014-15

MATERIAL SCIENCE IN ENGINEERING

Time : **3** Hours] [Total Marks : **100**

1 Attempt any **four** parts : **5×4=20**

a) State any one application of the following ceramics:
   I. alumina
   II. silica
   III. barium titanate
   IV. zirconia
   V. boron carbide
   VI. diamond.

b) Name the various steps encountered in processing of ceramics

c) How do thermoplastics differ from thermosetting plastics?

d) State the potential application of Nanomaterials.

e) What is composite material? Give three examples of composites.

f) State the different types of corrosion control. Explain any one type in detail.

2 Attempt any **two** parts : **10×2=20**

a) Iron has a cubic structure and its atomic weight is 55.84. The density of iron is 7900 kg/m^3 and its lattice constant is 2.86 Å. Estimate the types of cubic structure.

b) Enumerate and sketch the unit cells of Bravais lattices.

c) Discuss briefly the general usefulness of the periodic table in reference to atomic structure.

3 Attempt any **two** parts : **10×2=20**

a) What is creep? Draw a typical creep curve and explain the different stages of creep.

b) Compare the microstructures of various cast iron and steel with neat sketch.

c) I. What is equilibrium? State its importance and objectives.

II. State Gibbs Phase rule. State its importance in detail.

4 Attempt any **two** parts : **10×2=20**

a) I. Give the composition , properties and uses of any two of the following :

a. Gray Cast Iron

b. Malleable Cast Iron

c. Nodular Cast Iron.

II. Give the composition, properties and uses of carbon steel.

b) Enumerate various heat treatment processes and explain any two of them briefly.

c) I. Enumerate physical and chemical properties of aluminum

II. What are typical alloys of copper used in engineering? Describe briefly their composition and uses.

5 Attempt any **two** parts : **10×2=20**

a) What are dielectric materials? Enumerate the applications of dielectrics.

b) What is the difference between hard and soft magnetic material? What are the characteristic and application of soft magnetic material?

c) I. Discuss the properties of Intrinsic Semiconductor

II. Discuss about the application of Semiconductor
