Printed Pages : 3

CH404

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

PAPER ID : **151404**

Roll No.

B. Tech.

(SEM. IV) THEORY EXAMINATION, 2014-15

MATERIAL SCIENCE

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

Note : Attempt questions from **all** sections as per instructions.

SECTION – A

1 Attempt **all** parts. All parts carry equal marks : **2×10=20**

(a) Differentiate between annealing and tempering.

(b) What is lever rule ?

(c) Define the term hardness and hardenability.

(d) What are the atomic models ?

(e) What are the Bravais lattices ?

(f) What do you mean by primary and secondary bonding ?

(g) Write the application of aluminium and its alloys.

(h) Define unit cell and space lattice.

(i) Which material is used for transformer core and why ?

(j) Define solid solution. What are the types of solid solution ?

SECTION – B

2 Attempt any **three** parts. All parts carry equal marks : **10×3=30**

(a) What are the importance of materials in the engineering and how material science is related to engineering ?

(b) Explain X-ray crystallography techniques.

(c) Differentiate between toughness and hardness in detail.

(d) List classification of carbon steels Describe their properties and typical applications.

(e) Write short notes on the following :

(i) Soft and hard magnetic materials.

(ii) Messier effect.

SECTION – C

3 Attempt all question. All question carry equal marks. **10×5=50**

(a) Discuss the significance of atomic radius and packing fraction also calculate the atomic radius and atomic packing fraction of cubical crystals.

OR

What do you understand by Miller indices and also explain how to find out Miller indices.

(b) What is non destructive testing (NDT) ? Explain any one method for crack determination.

OR

What are the defects and imperfection in a crystal ? Describe them with neat sketches.

(c) What is 'heat treatment' ? What is the purpose of it ?

OR

Write properties and application of following :

(i) Nickel

(ii) Zinc

(d) What is meant by magnetic storages and why do we require them ? Give a brief description of different types of magnetic storages.

OR

Describe various types of semiconductors, its devices and its applications.

(e) Define corrosion. Explain different types of corrosion and methods of prevention of material from corrosion.

OR

Enumerate various method of ceramic processing, Discuss their salient feature in detail. Explain any one processing in detail.
