**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.