

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

PAPER ID : 0933

Roll No.

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B.Tech.

(SEMESTER-III) THEORY EXAMINATION, 2012-13

MATERIAL SCIENCE

Time : 3 Hours]

[Total Marks : 100

Section – A

1. Attempt **all** questions. All questions carry equal marks. $2 \times 10 = 20$
- What are the Bravais lattices ?
 - Explain atomic mass and atomic number.
 - What is TTT curve ?
 - Define Solid solution. What are the types of solid solution ?
 - Define the terms: Annealing, Normalizing.
 - Write the applications of Aluminum and its alloys.
 - What is superconductivity ? Give its applications.
 - What is Hysteresis loop ?
 - What is the importance of plastics in engineering applications ?
 - What are the properties and applications of ceramics ?

Section – B

2. Attempt any **three** questions. All questions carry equal marks. $3 \times 10 = 30$
- What is Atomic packing factor ? Calculate the atomic packing factor for Copper.
 - Explain the method used to determine the grain size of material.
 - Explain the following :
 - Tempering
 - Quenching
 - Case Hardening
 - Distinguish between :
 - Intrinsic semiconductors and extrinsic semiconductors.
 - n-type semiconductors and p-type semiconductors.
 - Explain various types of plastics with their applications.

Section – C

3. Attempt **all** questions. **All** questions **any** equal marks.

5 × 10 = 50

(a) Explain Bohr's Atomic model. What are the deficiencies in Bohr's theory ?

OR

List the different types of defects in solids. Explain any two in detail.

(b) Write notes on the following :

- (i) Fatigue testing
- (ii) Non-destructive testing
- (iii) Creep testing

OR

State and explain Gibb's phase rule.

(c) Write properties and applications of following :

- (a) Brass
- (b) Bronze
- (c) Nickel
- (d) Chromium

OR

Explain different types of annealing processes.

(d) Compare diamagnetic, paramagnetic and Ferromagnetic materials.

OR

Explain the following :

- (i) Soft and hard magnetic materials.
- (ii) Messier effect.

(e) Write notes on :

- (i) Composite materials
- (ii) Processing of Ceramics
- (iii) Concrete

OR

Define corrosion. Explain different types of corrosion and methods of corrosion prevention.