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

PAPER ID : 0933 Roll No. | | | | | | | | | | |

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. $2 \times 10 = 20$

(a) What are the Bravais lattices ?

(b) Explain atomic mass and atomic number.

(c) What is TTT curve ?

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

(e) Define the terms: Annealing, Normalizing.

(f) Write the applications of Aluminum and its alloys.

(g) What is superconductivity ? Give its applications.

(h) What is Hysteresis loop ?

(i) What is the importance of plastics in engineering applications ?

(j) What are the properties and applications of ceramics ?

Section – B

2. Attempt any **three** questions. **All** questions carry equal marks. $3 \times 10 = 30$

(a) What is Atomic packing factor ? Calculate the atomic packing factor for Copper.

(b) Explain the method used to determine the grain size of material.

(c) Explain the following :

(i) Tempering

(ii) Quenching

(iii) Case Hardening

(d) Distinguish between :

(i) Intrinsic semiconductors and extrinsic semiconductors.

(ii) n-type semiconductors and p-type semiconductors.

(e) Explain various types of plastics with their applications.

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Section – C

3. Attempt **all** questions. **All** questions **any** equal marks. $5 \times 10 = 50$

(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.