Printed Pages : 4 | 107 | NOE-037/EOE-037

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

Paper ID : 199357/ 199367

Roll No. 1 4 0 3 2 0 0 0 4 8

B.Tech.

(SEM. III) THEORY EXAMINATION, 2015-16

MATERIAL SCIENCE

[Time : 3 hours] **[MaximumMarks : 100]**

Section-A

1. Attempt all sections. All sections carry equal marks. Write answer of each section in short. (10×2=20)

(a) What are "Miller indices"?

(b) Calculate atomic packing factor for HCP and FCC.

(c) Explain X-ray crystallography in short.

(d) What is heat treatment?

(e) What is primitive cell?

(f) Explain the term machinability.

(g) What is plastic deformation?

(h) Explain the term NDT.

(i) Explain crystal and whiskers.

(j) What are smart and Nano material?

Section-B

Note: Attempt *any five* questions from this section.

(10×5=50)

2. Write brief notes on following:

   (i) Glass

   (ii) Thermoplastic

   (iii) Ceramic materials

3. Explain any two of the following:

   (i) Edge dislocation

   (ii) Twin boundary

   (iii) Schottky's Defect

4. Explain lever rule. Why it is important in binary phase diagram?

5. Explain Plastics, its processing & applications.

6. What is the importance of engineering materials? Classify it.

7. Explain TTT diagram in brief. What information do you get from this diagram?

8. How Griffith's theory explains the mechanism of fracture for brittle material?

9. Sodium chloride crystal has FCC structure the density of NaCl is 2.18gm/cc, calculate the distance between two adjacent atoms. Atomic weight of sodium is 23 and that of chlorine is 35.5.

Section-C

Note: Attempt *any two* questions from this section

(2×15=30)

10. Write short note on:

(a) Composite material and its applications.

(b) Smart material and its applications.

(c) Corrosion and its prevention.

11. What do you understancd by Imperfection in crystal structure and explain imperfections in the following?

    (a) Lattice vibrations

    (b) Point defects

    (c) Surface or planar defects

12. Explain the following:

    (a) Austempering and tempering

    (b) Recrysrallization temperature

    (c) P-type and N-type semiconductor

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