



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

PAPER ID : 140311

Roll No.

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B. Tech.

(SEM. III) (ODD SEM.) THEORY
EXAMINATION, 2014-15

MATERIAL SCIENCE

Time : 3 Hours]

[Total Marks : 100

- 1 Attempt any FOUR parts : 5×4=20
- a) What are some of the typical characteristics of ceramic materials?
 - b) Name some applications where ceramics are used.
 - c) What are the special properties of plastics that make them useful engineering materials?
 - d) What are the factors which determine the mechanical behavior of plastics?
 - e) Write short notes on Smart material with its application
 - f) Briefly explain mechanism of fatigue and corrosion with neat sketches.

2 Attempt any TWO parts : $10 \times 2 = 20$

- a) What do you mean by Miller Indices? Explain the procedure for finding Miller Indices.
- b) NaCl structure has FCC Structure. The density of NaCl is 2.18 cm^3 . Calculate the distance between two adjacent atoms.
- c) Enumerate the various atomic models proposed by scientist over the last few decades.

3 Attempt any TWO parts : $10 \times 2 = 20$

- a) What is a fatigue failure? How is a fatigue test carried out?
- b) What is specimen preparation? Explain the steps involved in specimen preparation.
- c) Draw the Iron-carbon equilibrium diagram and explain the features.

4 Attempt any TWO parts : $10 \times 2 = 20$

- a) State and explain Fick's First and Second Law.
- b) What is TTT Diagram? Explain briefly with neat sketch stating its importance.
- c) I. State the comparison of Cast iron, Wrought iron and Mild steel.
II. Classify Brass and explain any two type stating its composition.

5 Attempt any TWO parts : $10 \times 2 = 20$

- a) Explain the following :
 - I. Ferromagnetism
 - II. Diamagnetism.
- b) Distinguish between intrinsic and extrinsic semiconductor. Discuss why intrinsic semiconductor is not used in semiconductor devices.
- c) Define superconductivity. Explain Type II superconductor in detail and application of Type II superconductor in detail.