ME 213 (R-22)

Total No. of Questions : 10] [Total No.of Pages : 02

II/IV B. Tech. DEGREE EXAMINATIONS, AUGUST - 2024

First Semester

MECHANICAL ENGINEERING

MATERIAL SCIENCE AND METALLURGY

Time : **Three Hours** Maximum : **70** Marks

Answer ONE Question from each Unit. 5x14=70 M

All Questions carry equal marks.

UNIT - I

1. a) Explain point defect, Line defect and plane defect.

   b) What is a solid solution ? What factors do control the solubility of elements ?

(OR)

2. a) List out the mechanical properties of materials. Explain any five properties.

   b) Mention the types of solid solutions with examples.

UNIT - II

3. Describe Iron - Iron carbide diagram with a neat sketch.

(OR)

4. a) Explain AI-Cu phase diagram with various reactions in it.

   b) Explain the solidification of hypereutectic cast steel.

UNIT - III

5. a) Describe Annealing and tempering.

   b) Explain the term composite material with examples. State the advantages and limitations of composites in practice.

(OR)

P.T.O.

6. a) Compare the processes of flame hardening with induction hardening.

   b) Write short notes on

      (i) Particulate composites.

      (ii) Fiber reinforced composites.

UNIT - IV

7. Discuss the methods of producing metal powders.

(OR)

8. Explain the secondary operations of sintering in detail.

UNIT - V

9. a) Write a short note on the copper and its alloys.

   b) Explain the properties and applications of aluminum and its alloys ?

(OR)

10. a) Illustrate the structure and properties of grey cast iron.

    b) Write the properties of alpha titanium alloy. Explain its typical applications.