

B. Tech I Year II Semester (R17) Regular Examinations, May/June - 2018
MATERIAL SCIENCE AND ENGINEERING
(ME)

Time: 3 hours

Max Marks: 70

PART – A

1. Answer any **TEN** questions (10 x 2 = 20 Marks)
- (a) Mention the types of solid solutions.
 - (b) State the Hume Rotherys rules.
 - (c) State the Lever rule.
 - (d) Write short notes on Gibb's phase rule.
 - (e) What are the uses of Spheroidal graphite and Alloy cast irons?
 - (f) What are the Hadfield manganese steels?
 - (g) What is meant tempering and Hardenability?
 - (h) What is meant by alloying steel?
 - (i) What is meant by Age hardening treatment?
 - (j) Write the differences between hardness and hardenability?
 - (k) What is meant by the term Elastomer?
 - (i) What are the disadvantages of synthetic fibres?

PART - B

Answer all **FIVE** units (5 x 10 = 50 Marks)

UNIT-I

2. Explain the factors for Unlimited solubility solution (Hume Rothery rules)?

OR

3. Explain the effect of grain boundaries on the properties of alloys?

UNIT-II

4. With neat sketch explain Iron-Carbon equilibrium diagram.

OR

5. Explain the relationship between equilibrium diagrams and properties of alloys?

UNIT-III

6. Write the composition, microstructure and properties of Gray and Malleable Cast iron.

OR

7. Write the structure and properties of Titanium and its alloys.

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UNIT-IV

8. With neat sketch explain the effect of alloying elements on iron-carbide diagram.

OR

9. What are TTT diagrams? How they are constructed? Explain.

UNIT-V

10. Write a note on fiber reinforced composites and metal – matrix composites

OR

11. Write a note on glasses and cermets.
