

B. Tech I Year II Semester (R17) Supplementary Examinations, July/August - 2018
MATERIAL SCIENCE AND ENGINEERING
(ME)

Time: 3 hours

Max Marks: 70

PART – A

1. Answer any **TEN** questions (10 x 2 = 20 Marks)
- Define grain and grain boundaries.
 - What are the advantages of alloying?
 - Write short notes on equilibrium diagrams.
 - Write short notes on binary phase diagrams.
 - What are the properties of copper and its alloys?
 - What are the Low alloy steels?
 - What is meant by TTT? What are the different names for the TTT diagram?
 - What is meant by Age hardening treatment?
 - Write any two uses of Eutectic alloys.
 - Write short notes on hardenability?
 - What is meant by the term polymer?
 - What are the advantages of natural fibres?

PART - B

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

UNIT-I

2. Explain the nature of metallic and covalent bond with examples?
- OR
3. Explain the effect of grain boundaries on the properties of metal?

UNIT-II

4. Draw Fe-Fe₃C phase diagram and label all the phase fields. Write the invariant reactions involved.
- OR
5. Explain the concept of Coring with neat diagram?

UNIT-III

6. Write the structure and properties of Gray and Malleable Cast iron.
- OR
7. Write the composition, microstructure and properties of copper 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. Write a note on a) Annealing and b) Hardening.

UNIT-V

10. What are the advantages, limitations and applications of glasses?
- OR
11. Describe two manufacturing methods of polymer matrix composite.
