

MATERIAL SCIENCE & ENGINEERING

(Mechanical Engineering)
(Graph paper may be Issued)

Time: 3 hours

Max. Marks: 70

PART – A

(Compulsory Question)

- 1 Answer the following: (10 X 02 = 20 Marks)
- What is crystallization of metals?
 - What is a solid solution? Give an example.
 - What is Gibb's phase rule?
 - For a binary eutectic alloy, how does a typical cooling curve looks like?
 - Which cast iron is called as temper carbon? Why?
 - How can the properties of gray cast iron varied?
 - Why is cryogenic treatment done to alloys?
 - Differentiate age hardening from hardenability.
 - What are cermets? Give examples.
 - Give the applications of metal ceramic mixtures.

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT - I

- 2 Explain about various types of bonds with examples.

OR

- 3 What are Hume Rotherys rules? Discuss in detail.

UNIT - II

- 4 With a neat sketch, explain the importance of Fe-Fe₃C equilibrium diagram.

OR

- 5 Draw an equilibrium diagram for an isomorphous system of your choice to scale and label all the points. Explain its important features.

UNIT - III

- 6 Classify steel. Explain about the structure and properties of plain carbon steel.

OR

- 7 Discuss about the structure and properties of Aluminium and its alloys.

UNIT - IV

- 8 Explain about various hardening methods in use for alloys

OR

- 9 Discuss in detail about the heat treatment of plastics.

UNIT - V

- 10 What are cermets? What are their properties? How are they manufactured? Give examples?

OR

- 11 What are carbon composites? Discuss about their micro structure and properties.
