

B.Tech I Year II Semester (R15) Regular & Supplementary Examinations May 2018

MATERIAL SCIENCE & ENGINEERING

(Mechanical Engineering)

Time: 3 hours

Max. Marks: 70

PART – A
(Compulsory Question)

- 1 Answer the following: (10 X 02 = 20 Marks)
- (a) How grain boundary influences the ductility of material.
 - (b) What is the necessity alloying?
 - (c) What is the significance of lever rule?
 - (d) List out the significance of studying the equilibrium diagrams.
 - (e) Mention the reasons for alloying cast iron.
 - (f) Give the classification of aluminum alloys.
 - (g) What is cyaniding process?
 - (h) Explain the normalizing treatment.
 - (i) What is the difference between tempered and laminated glass.
 - (j) List the functions of matrix materials and reinforcements used in MMCs.

PART – B
(Answer all five units, 5 X 10 = 50 Marks)**UNIT – I**

- 2 Define crystallization of metal. Explain briefly about the crystalline dislocations.

OR

- 3 With a neat sketch, explain the substitutional solid solution and interstitial solid solution.

UNIT – II

- 4 (a) List five suitable applications where eutectic alloys are used.
(b) Describe Gibbs phase rule.

OR

- 5 Explain the binary phase diagram of Fe- Fe₃C.

UNIT – III

- 6 Write down the classification, composition, properties and uses of any two types of cast iron.

OR

- 7 Briefly explain the structure and properties of titanium and its alloys.

UNIT – IV

- 8 What is TTT diagram? Explain the steps employed to construct the TTT diagram.

OR

- 9 Explain briefly different surface hardening methods.

UNIT – V

- 10 Explain briefly the properties of ceramics. List any five types of glasses with composition and use.

OR

- 11 How are composites are classified. Explain any two manufacturing process of composites.
