Code: 15A03201

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)
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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- Fe_3C.

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.

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