B.Tech II Year I Semester (R15) Supplementary Examinations June 2017

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) List few characteristics of metallic bonding in solids.
(b) Write short notes on intercept method of grain size measurement.
(c) What do you mean by eutectic reaction?
(d) Write short notes on lever rule.
(e) What are various properties of aluminium?
(f) How do you classify alloy steels?
(g) What are the factors that affect any heat treatment process?
(h) What do you mean by hardenability?
(i) What do you mean by FRP?
(j) What are the applications of ceramics?

PART – B

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

UNIT – I

2 How do you classify the alloys? Explain different intermediate alloy phases with suitable examples.

OR

3 Discuss about substitutional solid solution with the help of neat diagrams and examples. Explain Hume Rothery's rules for having complete substitutional solid solution.

UNIT – II

4 With the help of a suitable example, explain the isomorphous alloy system.

OR

5 (a) What are various experimental methods of construction of equilibrium diagrams?
(b) With the help of a neat diagram, explain allotropy of iron.

UNIT – III

6 Explain the microstructure, properties and applications of different types of malleable cast irons with the help of neat sketch.

OR

7 What are stainless steels? Why they are stainless? Give typical composition and applications of different types of stainless steels.

UNIT – IV

8 Explain the method of constructing TTT diagrams with the help of neat diagrams.

OR

9 Explain age hardening mechanism with a suitable example.

UNIT – V

10 Differentiate between metal matrix composites and C-C composites.

OR

11 What are cermets? Explain the properties and various applications of cermets.

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