

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)

- 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.
