Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 21564

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2013.

Fourth Semester

Mechanical Engineering

ME 2253/ME 44/ME 1253/10122 ME 304/080120017 — ENGINEERING MATERIALS AND METALLURGY

(Common to Automobile Engineering and Mechanical and Automation Engineering)

(Regulation 2008/2010)

(Common to PTME 2253 – Engineering Materials and Metallurgy B.E. (Part – Time) Third Semester – Mechanical Engineering – Regulation 2009)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Write the constitution of austenite and its crystal structure.
2. Classify the plain carbon steels.
3. What are different processes of surface hardening?
4. When is the annealing process preferred?
5. Define plastic deformation.
6. What is creep?
7. What is the effect of chromium alloying element on the properties of steel?
8. What are bronzes? List some uses of bronzes.
9. Define plastics.
10. What is PA?

PART B — (5 × 16 = 80 marks)

11. (a) Explain with neat sketch the eutectic systems? Give examples for this system. (16)

Or

(b) With the help of neat sketch explain the two types of solid solution. (16)

12. (a) (i) Distinguish between annealing and normalizing. (6)

(ii) Explain with neat setup fig the working principle of an induction hardening. (10)

Or

(b) Explain jominy test (or) End quench harden ability test with the help of the neat sketchs. (16)

13. (a) Explain the mechanism of plastic deformation by slip and twinning with neat sketch. (16)

Or

(b) Sketch and describe the fatigue test. (16)

14. (a) Write short notes on

(i) Maraging steels (5)

(ii) Stainless steels (5)

(iii) High speed steels. (6)

Or

(b) (i) Name non ferrous materials for the following articles

(1) Bush

(2) Furnaces Heating element

(3) Type writer parts

(4) coins

(5) girders for airship

(6) Big end bearing

(7) filament of electric lamps

(8) Turbine blades. (8)

(ii) Write short notes on

(1) Bearing metals

(2) Brasses. (8)

15. (a) Write notes on

(i) PVC

(ii) PF

(iii) Glass

(iv) PMMA (16)

Or

(b) (i) What is polymerization? Describe addition polymerization and condensation polymerization. (10)

(ii) How plastic materials are classified? Explain each classification. (6)
