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Question Paper Code : 60851

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

Fourth Semester

Mechanical Engineering

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

(Common to Automobile Engineering, Mechanical and Automation Engineering)

(Regulations 2008/2010)

(Common to PTME 2253/10122 ME 304 – Engineering Materials and Metallurgy
for B.E. (Part-Time) Third Semester – Mechanical Engineering –
Regulations 2009/2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Write the construction of austenite and its crystal structure.
2. Classify the Plain carbon Steels.
3. State the application of isothermal transformation diagram.
4. Which type of surface hardening Process that does not involve composition change?
5. What is meant by slip and twinning?
6. Define fracture toughness.
7. Explain why copper is a suitable material for automobile radiators.
8. Define the term maraging.
9. Brief about any two types of polymers.
10. What are the applications of Poly Styrenes?

PART B — (5 × 16 = 80 marks)

11. (a) Explain the solid solutions strengthening of a metal by alloying. (16)
- Or
- (b) Explain the equilibrium cooling of a Cu-Ni alloy system with phase diagram. (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 sketches. (16)
13. (a) (i) Explain the mechanism of slip and deformation by twinning. (12)
- (ii) Write short notes on polycrystalline material. (4)
- Or
- (b) Explain the types of impact teats and how ductile to brittle transition is occur with diagram. (16)
14. (a) (i) Brief on the influence of alloying elements in steel under classification of ferrite and austenite stabilizer. (10)
- (ii) List the types and their typical applications of tool steel. (6)
- Or
- (b) (i) What are the types of cast iron or copper alloy, their composition, properties and applications? (8)
- (ii) Brief on the precipitation hardening and ageing treatment of Al-Cu alloy. (8)
15. (a) What are the properties and Application of PVC, PET, PP and PC? Explain.
- Or
- (b) Write a short note on :
- (i) PTFE (4)
- (ii) Phenol formaldehyde (4)
- (iii) Engineering Ceramics (4)
- (iv) Fiber Rein forced Plastic. (4)