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

Question Paper Code : X67692

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2020.

Fourth Semester

Mechanical Engineering

ME 1253 — ENGINEERING MATERIALS AND METALLURGY

(Regulations 2008)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Describe continuous casting of steel.

2. Why is the grain boundary irregular?

3. Write the importance of spheroidising annealing.

4. Define hardenability and case depth.

5. Sketch Slip and Twinning types of deformation.

6. Differentiate between Fatique and Creep tests.

7. What is Precipitation hardening?

8. What are bronzes? List some uses of bronzes.

9. List two important characteristics of polymers.

10. What is a hybrid composite?

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) Explain the Isothermal Transformation diagram for a Eutectoid Iron-Carbon alloy with superimposed cooling curves.

Or

(b) Write a short note on :

(i) Hardenability

(ii) Nitriding

(iii) Flame hardening

(iv) Cyaniding. (4 × 4 = 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) Explain the effect of increasing chromium content in carbon steel. (10)

(ii) Write short notes on cold work tool steels. (6)

Or

(b) (i) Explain the most important characteristics and applications of aluminum and its alloys. (12)

(ii) Write a note on cupronickel. (4)

15. (a) Explain the following polymers with its structures

(i) Polyethylene

(ii) Polypropylene

(iii) Polybutylene

(iv) Polyvinyl chloride. (16)

Or

(b) Explain the mechanical, physical and chemical properties of ceramics.(16)

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