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

Question Paper Code : 41394

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2018
Third/Fourth Semester
Mechanical Engineering
ME 6403 – ENGINEERING MATERIALS AND METALLURGY
(Common to Automobile Engineering, Manufacturing Engineering and Mechanical and Automation Engineering)
(Regulations 2013)

Time : Three Hours | Maximum : 100 Marks

Answer ALL the questions.

PART – A **(10×2=20 Marks)**

1. What is an equilibrium phase diagram ?
2. Define Cementite and Pearlite in Fe-C alloys.
3. What are the needs of annealing process ?
4. What are the factors should be considered while selecting a quenching medium ?
5. What are three primary groups of plain carbon steels ?
6. What is meant by precipitation hardening ?
7. Distinguish between thermoplastics and thermosetting plastics.
8. What is meant by PSZ ?
9. Differentiate between Brittle and ductile fracture.
10. What are the factors affecting fatigue ?

PART – B (5×13=65 Marks)

11. a) Draw the Iron-Carbon equilibrium phase diagram and discuss the different phases that takes place in it. (13)

(OR)

b) Discuss the classification, properties and application of steel. (13)

12. a) What is hardenability ? Describe a test that is used for determination of hardenability of steel. (13)

(OR)

b) What is case hardening ? Explain in details the carburizing processes. (13)

13. a) Write a short notes on :

i) HSLA steel
ii) Maraging steel
iii) Stainless steel. (5+4+4)

(OR)

b) Discuss the characteristics of copper and its alloys, their properties and applications. (13)

14. a) Explain the properties and applications of the following polymer materials.

i) Polystyrene
ii) Polyethylene
iii) Polypropylene. (5+4+4)

(OR)

b) How engineering ceramics are classified ? Explain their properties and applications. (13)

15. a) Explain testing procedure for Rockwell hardness test. (13)

(OR)

b) Explain the testing procedure of Tensile Test of Material. (13)

PART – C (1×15=15 Marks)

16. a) What type of failure is occurring when a circular rod is subjected to a constant load at high temperature ? Explain the testing procedure. (15)

(OR)

b) What are the different types of cast irons ? Explain with neat sketch of the microstructure of any four types of cast irons. Give application for each. (15)