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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 ?

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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 : (5+4+4)
i) HSLA steel
ii) Maraging steel
iii) Stainless steel.
(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. (5+4+4)
i) Polystyrene
ii) Polyethylene
iii) Polypropylene.
(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)