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

Question Paper Code: 31572

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2020

Fifth Semester

Mechanical Engineering

01UME502 – ENGINEERING MATERIALS AND METALLURGY

(Regulation 2013)

Duration: One hour Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

1. Increase of ferrite phase in steel increases

   (a) Strength (b) Hardness (c) Ductility (d) Brittleness

2. Eutectic reaction for iron carbon system occurs at

   (a) 600^0 C (b) 723^0 C (c) 1147^0 C (d) 1493^0 C

3. Hardness of steel is greatly improved with

   (a) Annealing (b) Cyaniding (c) Normalising (d) Tempering

4. Which one of the following mediums is used for fastest cooling rate of steel quenching

   (a) Air (b) Oil (c) Water (d) Brin

5. The ability of a material to absorb energy in the plastic range is called

   (a) resilience (b) creep (c) fatigue strength (d) toughness

6. Poisson's ratio is

   (a) linear stress/lateral stress (b) Linear strain/lateral strain
   (c) lateral stress/lateral stress (d) lateral strain/linear strain

7. Cast iron is manufactured in

(a) blast furnace (b) cupola
(c) open hearth furnace (d) bessemer converter

8. Aero plane and certain automobile parts are usually made of

(a) Magnalium (b) Aluminium bronze
(c) Duralumin (d) German silver

9. Structure of a polymer is

(a) Long Chain (b) Rhombic
(c) Cubic (d) Closed pack hexagonal

10. Which one of the following materials is not a composite?

(a) Wood (b) Concrete (c) Plywood (d) Sialon

PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

11. What are cooling curves? How does the time-temperature cooling curve of an alloy of eutectic composition differ from that of a pure metal? (8)

12. Explain in detail on annealing, normalizing, austempering and case hardening. (8)

13. What are slip and twinning? What are their characteristics? (8)

14. Write an engineering brief about the following steels:

(i) Tool steel (ii) HSLA steel (iii) Marging steels (8)

15. Write on engineering brief about the following thermoplastics:

(i) Polyethylene (ii) Polyvinyl chloride
(iii) Acetyl and (iv) Polyamides (8)