No. of Printed Pages : 4 180342/120342/30342/030433/
Roll No..... 441/84542/105242/94751

4th Sem, **Branch :** Mechanical Engineering
Subject : Materials and Metallurgy

Time : 3 Hrs. **M.M. : 100**

SECTION-A

Note : Multiple choice questions. All questions are compulsory. (10x1=10)

Q.1 Cast iron has the property of (CO-1)
a) Ductility b) Elasticity
c) Malleability d) Brittleness

Q.2 The ability of the material to deform without breaking is called. (CO-1)
a) Resistance b) Creep
c) Plasticity d) Fatigue

Q.3 The ability of the material to resist fracture due to high impact loads is. (CO-2)
a) Toughness b) Hardness
c) Brittleness d) None of these

Q.4 The mass per unit volume of a material is called (CO-2)
a) Specific volume b) Density
c) Specific gravity d) None of these

Q.5 Crystal structure of zinc is (CO-3)
a) F.C.C. b) B.C.C.
c) S.C. d) H.C.P.

Q.6 Fatigue results in (CO-3)
a) Brittle fracture b) Ductile fracture
c) Elongation d) None of these

Q.7 Hook's law holds good upto. (CO-3)
a) Limit of proportionality
b) Elastic limit
c) Yield point
d) Breaking point

Q.8 Plastic deformation may take place due to. (CO-4)
a) Slip only b) Twinning only
c) Slip or Twining d) None of these

Q.9 Which of the following is an example of solid solution alloy? (CO-4)
a) Au-Ag b) Au-Pt
c) Cu-Ni d) All of these

Q.10 The highest percentage of carbon that an iron carbon alloy can have is. (CO-5)
a) 2% b) 6.67%
c) 4.70% d) 5.34%

SECTION-B

Note : Objective type questions. All questions are compulsory. (10x1=10)

Q.11 Define ferrous metal. (CO-1)

Q.12 Define creep. (CO-1)

Q.13 Name any two semi-conductors. (CO-1)

Q.14 Define fatigue. (CO-2)

Q.15 Define unit cell. (CO-2)

Q.16 Name two types of solids. (CO-2)

Q.17 Define atomic radius. (CO-3)

Q.18 Define stainless steel. (CO-3)

Q.19 Define ceramics. (CO-5)

Q.20 Name any four iron ores. (CO-4)

SECTION-C

Note : Short answer type questions. Attempt any twelve questions out of fifteen questions. (12x5=60)

Q.21 Defines Ferrous metals with one example. (CO-1)

Q.22 Define Hardness and Brittleness of a material. (CO-1)

Q.23 Define Creep. (CO-1)

Q.24 Draw cooling curve of a pure metal. (CO-2)

Q.25 Define atomic packing factor. (CO-2)

Q.26 Differentiate between intrinsic and extrinsic semi-conductors. (CO-1)

Q.27 What do you mean by physical properties of a material? Name any four. (CO-1)

Q.28 Differentiate between elastic and plastic deformation. (CO-2)

Q.29 Derive an expression for the atomic radius of body centered cubic structure. (CO-2)

Q.30 What are line defects? What are its various types? (CO-2)

Q.31 Write the properties of solid solution alloys (any five). (CO-3)

Q.32 Write the application of stainless steel. (Any five). (CO-3)

Q.33 Write the properties of high speed steel. (CO-4)

Q.34 What is dipping? (CO-5)

Q.35 Write any five application of composite materials. (CO-6)

SECTION-D

Note : Long Answer type question. Attempt any two questions. (2x10=20)

Q.36 Explain various grades of stainless steel and their nomenclature. (CO-2)

Q.37 What are smart materials? What are their different types? Explain. (CO-6)

Q.38 Explain IRON-CARBON equilibrium diagram. (CO-5)

Note : Course Outcome (CO) mentioned in the question paper is for official purpose only.