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220342

4th Sem / Automobile, Mechanical, Mech (Tool & Die)

Subject : Materials and Metallurgy

Time : 3 Hrs. M.M. : 60

SECTION-A

Note: Multiple choice questions. All questions are compulsory (6x1=6)

Q.1 In B.C.C. structure, the numbers of atoms in a unit cell are

a) 1 b) 2

c) 4 d) 6

Q.2 Which of the following is/are Point defects?

a) Schottky defect b) Vacancy defect

c) Substitutional defect d) All of these

Q.3 The thermal equilibrium diagram is also known as

a) Phase diagram

b) Constitutional diagram

c) Both (a) & (b)

d) Neither (a) nor (b)

Q.4 The type of space lattice found in α-iron is

a) F.C.C. b) B.C.C.

c) H.C.P d) None of the above

Q.5 The best quality of steel is produced in

a) Cupola b) Bessemer converter

c) Open hearth furnace d) Induction furnace

Q.6 The trade name of polystyrene is

a) Thermocole b) Mica

c) Cork d) Glass Wool

SECTION-B

Note: Objective/ Completion type questions. All questions are compulsory. (6x1=6)

Q.7 Define ferrous metals.

Q.8 Hook's law holds valid within _____

Q.9 HSS stands for _____

Q.10 Pearlite is a mixture of ferrite and _____

Q.11 Name types of pyrometers.

Q.12 What is asbestos?

SECTION-C

Note: Short answer type questions. Attempt any eight questions out of ten questions. (8x4=32)

Q.13 Give the classifications of materials.

Q.14 Draw the stress-strain diagram of tensile test of mild steel. Show the prominent points on the curve.

Q.15 Differentiate between slip and twinning.

Q.16 Draw & Explain cooling curve of a pure metal.

Q.17 State & Explain lever rule.

Q.18 What is plain carbon steel? Explain its different types? Explain.

Q.19 Write short note on:

I) Nitriding

II) Cyaniding

Q.20 What is a refractory material? What are its different types? Explain.

Q.21 Explain nuclear energy materials.

Q.22 Explain any four mechanical properties of materials.

SECTION-D

Note: Long answer type questions. Attempt any two questions out of three questions. (2x8=16)

Q.23 Derive an expression for the atomic packing factor of body centred cubic structure

Q.24 Draw and explain iron carbon equilibrium diagram.

Q.25 Explain the manufacturing of steel by Bessemer & open hearth processes.