
ANSWER ANY FIVE QUESTION
ALL QUESTIONS CARRY EQUAL MARK

1 a. Define space lattice. Find out basic atoms and packing factors and packing densities for B.C.C and F.C.C. Draw concerned figures

b. Explain crystal imperfections with figures.

c. State Fick's laws of diffusion?

2 a. Define engg stress and strain and true stress and strain. Find out the relationship between true stress and engg. stress.

b. Define hardness. Draw the figure of Brinell hardness testing machine and label the parts.

c. Explain slip and twinning with figures.

3 a. Explain type of fractures with figures.

b. Explain creep curve ?

c. Explain factors affecting fatigue life?

4 a. Define solid solutions and Explain different types of solid solutions with figures?

b. State Gibbs's phase rule and define the terms used. Discuss its importance.

c. Explain the construction of phase diagram with figure.

5 a. Draw Fe-C equilibrium diagram and label it. Show the invariant points on it. Write the reactions occurring at these points indicating the temperature and composition of each phase.

b. Explain the construction of TTT diagram with figure and label it.

c. Define Martensite, cementite, austenite and ferrite.

6 a. Define hardenability. Explain Jominy end quench tests with related figures.

b. Explain Austempering and Martempering with figures.

7 a. Explain different types of cast irons with microstructures.

b. Write short note on Al-alloy.

c. Define Brasses. Explain season cracking of brass and how to eliminate it.

d. Define bronze. Explain tin bronze's antifriction properties.

8 a. Write a note on passivation.

b. Explain the alloying method for corrosion protection.

c. Explain cathodic protection with figures.