Exam.Code:0942
Sub. Code: 6734

2054

B.E. (Mechanical Engineering)

Sixth Semester

MEC-605: Mechanical Behaviour of Materials

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Unit.

x-x-x

I Attempt the following (10x1)

a) Define Strain hardening.

b) Define inelastic deformation.

c) Write the importance of safety factor

d) What is creep?

e) What is Glass Transition Temperature?

f) Define fracture toughness.

g) Write Eutectic reaction in Iron carbon Equilibrium diagram?

h) What is tempered Martensite?

i) What is semi-crystalline polymer?

j) Define corrosion rate.

UNIT -I

II a) Explain the concept of elastic recovery after plastic deformation and its significance in material behavior.

b) Explain why the slip in a crystal is easiest in close-packed planes. (5,5)

III a) Discuss the differences between precipitation hardening and dispersion hardening.

b) Explain the processes of recrystallization, and grain growth in deformed metals. (5,5)

IV a) What are the main types of fractures observed in materials? Provide examples of each.

b) What is fracture toughness and how is it measured experimentally? (5,5)

UNIT -II

V a) Draw Iron-iron carbide equilibrium diagram and explain different invariant reactions.

b) Draw and explain TTT diagram. (5,5)

VI a) Discuss the effect of addition of the following allowing elements with steel

(i) Cr (ii) W (iii) Si (iv) Mo (v) V

b) Discuss the importance of processing conditions, such as temperature, pressure and shear rate on the properties of polymers. (5,5)

VII a) Explain Electro Chemical Corrosion with neat sketch

b) Write short notes about (i) Degradation of polymers (ii) Weathering (5,5)

x-x-x