Exam.Code:0942
Sub. Code: 33876

2055

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. Support your answers with neat diagrams as applicable.

x-x-x

1. Give short answers in 2-3 lines:
   (a) State the impact of plastic deformation of material on dislocations.
   (b) Define a stable crack?
   (c) Define the glass transition temperature?
   (d) Write eutectic and eutectoid reactions occurring on iron carbon diagram.
   (e) What is viscoelastic deformation? (5x2)

UNIT - I

2. An aircraft component is fabricated from an aluminum alloy that has a plane strain fracture toughness of 35 MPa$\sqrt{m}$. It has been determined that fracture results at a stress of 245 MPa when the internal crack length is 2.0 mm. For this same component and alloy, will fracture occur at a stress level of 325 MPa when the maximum internal crack length is 1.0 mm? Why or why not? (10)

3. Explain the generalized creep behavior under a constant load of metals. Discuss the influence of stress and temperature on creep characteristics. (10)

4. Explain Iron-Carbon diagram with neat sketch. Discuss the development of 0.4% carbon steel microstructure from liquid phase. (10)

UNIT - II

5. Discuss the stress strain behavior of brittle, plastic and highly elastic polymers. (10)

6. What are the limitations of TTT diagram, draw CCT diagram for Eutectoid steel and discuss development of different microstructures by varying the cooling rates. (10)

7. Discuss the environmental impact on materials and explain galvanic corrosion. (10)

x-x-x