

GUJARAT TECHNOLOGICAL UNIVERSITY
B. E. - SEMESTER – IV • EXAMINATION – WINTER 2012

Subject code: 142103**Date: 29/12/2012****Subject Name: Mechanical behavior and Testing of Materials****Time: 02.30 pm - 05.00 pm****Total Marks: 70****Instructions:**

1. Attempt any five questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Draw Stress-strain diagram for brittle and ductile material and label it properly. Define the following: 07
1. Ductility 2. Toughness 3. Young's Modulus 4. % Elongation
(b) Explain Rockwell Hardness Test method and list its advantages & limitations. 07
- Q.2** (a) Explain the procedure of tensile testing in brief. 07
(b) What is dislocation? Write note on sources of dislocations. 07
OR
(b) What do you mean by Burger's vector? Explain its role in identifying dislocations in a material. 07
- Q.3** (a) Explain in detail the Mechanisms of plastic deformation in polycrystalline materials. 07
(b) Classify material testing methods. Describe the criteria for selection of testing method. 07
OR
- Q.3** (a) Write a note on Recovery, recrystallization and grain growth. 07
(b) 'Testing of material is an important task for industry' - justify comment. 07
- Q.4** (a) Write a short note on effect of temperature and strain rate on flow properties 07
(b) Explain Charpy Impact test and derive Relationship for energy absorbed by specimen. 07
OR
- Q.4** (a) Write a note on Micro Hardness Test. Give the applications. 07
(b) Define Brittle fracture. Describe mechanism of Brittle fracture propagation. 07
- Q.5** (a) What do you mean by S-N curve? Differentiate between ferrous alloys and non ferrous alloys with reference to their respective S-N curves. 07
(b) Define Creep. Write a note on Mechanism of creep deformation in metals. 07
OR
- Q.5** (a) What is meant by fatigue failure? Write a note on fatigue Mechanisms in metals. 07
(b) Draw a typical creep curve and explain the various stages in creep. 07
