

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-IV • EXAMINATION – SUMMER • 2014****Subject Code: 142103****Date: 23-06-2014****Subject Name: Mechanical Behavior and Testing of Materials****Time: 10:30 am - 01:00 pm****Total Marks: 70****Instructions:**

1. Attempt all 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. **07**
Define the following:
1. Ductility 2. Toughness 3. Young's Modulus 4. % Elongation
- (b) Explain briefly elastic and plastic deformation with examples of each. **07**
- Q.2** (a) Differentiate between Engineering stress-strain curve & True stress- strain curve **07**
(b) What is dislocation? What is the sources of dislocations. Explain with sketch **07**
Frank-Read sources of dislocations.
- OR**
- (b) List strengthening mechanisms in solids. Explain any two with schematic diagrams **07**
- Q.3** (a) Classify types of testing methods. State criteria for selection of testing method **07**
giving examples for selection of the method.
(b) Explain critically about tensile testing with necessary diagrams **07**
- OR**
- Q.3** (a) Why annealing is done after cold working? Explain recovery, recrystallization and **07**
grain growth
(b) Explain Charpy Impact test and derive Relationship for energy absorbed by **07**
specimen
- Q.4** (a) Define Brittle fracture. Describe mechanism of Brittle fracture propagation **07**
(b) Derive formula for critical resolved shear stress? Explain its importance in plastic **07**
deformation
- OR**
- Q.4** (a) Write a note on Micro Hardness Test. Give the applications **07**
(b) 'Testing of material is an important task for industry' – justify comment. **07**
- Q.5** (a) What do you mean by Calibration? Why the calibration of Testing-Instruments is **07**
required? Explain by help of proper examples
(b) Discuss –Super plasticity **07**
- OR**
- Q.5** (a) What do you mean by S-N curve? Differentiate between ferrous alloys and non- **07**
ferrous alloys with reference to their respective S-N curves.
(b) Define Creep. Write a note on Mechanism of creep deformation in metals **07**
