

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

B.E. Sem-IV Remedial Examination Nov/ Dec. 2010

Subject code: 142103

Subject Name: Mechanical Behaviour & Testing of Materials

Date: 06 /12 /2010

Time: 03.00 pm – 05.30 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) Define Dislocation. Differentiate Edge & screw dislocation **07**
(b) Describe the process of “ Cross slip “ **07**
- Q.2** (a) Describe Izod impact Test. What are the Factors that affect impact strength. **07**
(b) Explain the Temperature dependency of impact Fracture **07**
- OR**
- (b) Define Fatigue. Write about the variables & its effects on Fatigue strength **07**
- Q.3** (a) Which are the techniques for observation of dislocations ? **07**
(b) Describe the dislocation in BCC & FCC cubic lattice **07**
- OR**
- Q.3** (a) Derive the formula for calculating Brinell Hardness Number. **07**
(b) What are the advantages/disadvantages of Brinell & Vickers Hardness Testing. **07**
Calculate BHN for $d=1.57$ mm & $d = 3.35$ mm Load is 3000 kgs
- Q.4** (a) What is the significance of Material Testing ? **07**
(b) Describe in detail basic properties of Materials **07**
- OR**
- Q.4** (a) What are the sources of dislocations ? write in details **07**
(b) Draw the crystallography plane & direction $(1 \ -1 \ 2)$, $(1 \ 0 \ -1)$, $[1 \ -2 \ 1]$, **04**
 $[0 \ 1 \ -2]$
(c) Describe the interaction of two edge dislocations **03**
- Q.5** (a) What is Creep ? Explain the creep curve & factors affecting creep strength. **07**
(b) Describe the creep testing procedure. **07**
- OR**
- Q.5** (a) Define Plastic deformation. Explain plastic deformation in polycrystalline materials. **07**
(b) Describe solid solution strengthening. Explain the effect of solute on SS curve. **07**
(stress – strain curve)
