Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- IVth SEMESTER–EXAMINATION – MAY/JUNE- 2012

Subject code: 142103 Date: 29/05/2012

Subject Name: Mechanical Behaviour 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)**	What is elastic and plastic deformation? Explain with examples.	**07**
	(b)	What is hardness? List hardness tests and explain in detail any one test.	**07**
Q.2	**(a)**	With stress-strain diagram explain in detail the behaviour of mild steel when subjected to tensile loading.	**07**
	(b)	What is dislocation? How it affects the mechanical properties of metals/alloys? What is Burger's vector?	**07**
		OR	
	(b)	Differentiate between Edge and Screw dislocations.	**07**
Q.3	**(a)**	Write a short note on: Microhardness testing.	**07**
	(b)	What is toughness? How it is measured? Explain Izod-Impact test.	**07**
		OR	
Q.3	**(a)**	Discuss about Recovery, Recrystallization and Grain growth.	**07**
	(b)	Explain briefly: (i) Frank-Read source (ii) Slip and Twinning.	**07**
Q.4	**(a)**	Draw labeled S-N curve and explain Fatigue. What is endurance limit?	**07**
	(b)	Explain Ductile-Brittle transition and its importance for selection of materials.	**07**
		OR	
Q.4	**(a)**	What is creep? Draw labeled creep curve. Explain three stages of creep.	**07**
	(b)	Explain the factors affecting Fatigue properties.	**07**
Q.5	**(a)**	Classify testing methods. What are the criteria for selection of testing method? Explain.	**07**
	(b)	Explain the importance of Calibration of testing equipments.	**07**
		OR	
Q.5	**(a)**	Discuss about techniques for observation of dislocations.	**07**
	(b)	What are the strengthening mechanisms in solids? With a schematic explain any two methods.	**07**

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