Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

B.E. Sem-IV Examination June- 2010

Subject code: 142103

Subject Name: Mechanical Behavior and Testing of Materials

Date: 19 / 06 /2010 **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)**	Define Fatigue. Explain mechanism of fatigue in metals. What are main factors affecting fatigue properties of materials.	**07**
	(b)	Short note on Recovery, Recrystallization, and Grain growth.	**07**
Q.2	**(a)**	What are different Hardness tests? Compare Rockwell Hardness test & Brinell Hardness test.	**07**
	(b)	What are fundamental principle which governs the strengthening mechanism in metals and alloys?	**07**
		OR	
	(b)	Define Creep. Explain the effect of stress and temperature on a Creep curve of materials. What are different factors affecting Creep failure.	**07**
Q.3	**(a)**	What are different Mechanical tests? Give comparison of true stress-strain curve and engineering stress-strain curve.	**07**
	(b)	Ductile – Brittle transition behavior of materials.	**07**
		OR	
Q.3	**(a)**	Write classification of different types of testing methods. Give importance of calibration & write different calibration methods.	**07**
	(b)	Explain mechanism of plastic deformation in single crystal.	**07**
Q.4	**(a)**	Explain briefly techniques for observations of dislocation.	**07**
	(b)	(I) Super plasticity	**03**
		(II) Briefly explain main factors affecting selection of materials.	**04**
		OR	
Q.4	**(a)**	(I) Short note on S – N curve.	**04**
		(II) Short note on Dislocation sources.	**03**
	(b)	What are different types of Impact test? Briefly explain advantages and disadvantages of each test.	**07**
Q.5	**(a)**	How intersection of dislocation plays an important role in plastic deformation? Explain intersection of two edge and edge with screw dislocation.	**07**
	(b)	What are different mechanical properties? Define three of them. Explain different factors affecting mechanical properties.	**07**
		OR	
Q.5	**(a)**	Write Vickers Hardness test with merits & demerits.	**07**
	(b)	What is Tensile test? What are main factors affecting the tensile properties of material?	**07**

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