GUJARAT TECHNOLOGICAL UNIVERSITY BE - SEMESTER-IV • EXAMINATION – SUMMER 2015

Subject Code: 142103 Date: 03/00		/2015	
Su	bject	Name: Mechanical Behaviour & Testing of Materials	
Ti	me:10	0.30am-01.00pm Total Marks: '	70
Ins	truction		
	1. 2. 3.	Attempt an questions. Make suitable assumptions wherever necessary. Figures to the right indicate full marks.	
Q.1	(a)	Define and explain the following properties: i) Ductility ii) Toughness iii) Resilience iv) % Elongation v) Young Modulus vi) Shear Modulus vii) Poisson's Ratio	07
	(b)	Draw Engineering & True stress strain curves. Why they are different? Typically which curve is referred to? Explain why?	07
Q.2	(a)	Explain briefly elastic and plastic deformation and Differentiate between plastic deformation by slip and twinning	07
	(b)	Define Dislocation. What are sources of dislocations? Difference between edge & screw dislocations	07
		OR	
	(b)	List strengthening mechanisms in solids. Explain any two with schematic diagrams	07
Q.3	(a)	'Testing of material is an important task for industry' - justify comment. Classify testing methods.	07
	(b)	Explain about Tensile test. Discuss the factors affecting Tensile properties of material	07
		OR	
Q.3	(a) (b)	Discuss about Recovery, Recrystallization and Grain growth Which test is used to measure toughness? Explain any one method.	07 07
Q.4	(a) (b)	Define Brittle fracture. Describe mechanism of Brittle fracture propagation Derive formula for critical resolved shear stress? Explain its importance in plastic deformation	07 07
		OR	
Q.4	(a)	Define Hardness. Explain Rockwell Hardness Test method. Mention Advantages and limitations of this method.	07
	(b)	Write a note on Micro Hardness Test. Give the applications	07
Q.5	(a)	What is Ductile-brittle transitions behavior and its significance. ? Draw Suitable diagram.	07
	(b)	What do you mean by Calibration? Why the calibration of Testing-Instruments is required? Explain by help of proper examples OR	07
Q.5	(a)	Define Fatigue. Explain mechanism of fatigue in metals. What are main Factors affecting fatigue properties of materials	07
	(b)	Define Creep. Write a note on Mechanism of creep deformation in metals	07
