Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV EXAMINATION – WINTER 2015

Subject Code: 142103 **Date:01/01/2016**

Subject Name: Mechanical Behavior & Testing of Materials

Time: 02:30pm to 05:00pm **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 the Following (i) Ductility (ii) Resilience (iii Toughness (iv) Elongation	**07**
	(b)	Differentiate between Engineering stress-strain curve & True stress- strain curve. Which curve is referred to? And why?	**04+03**
Q.2	**(a)**	What is dislocation? What is the sources of dislocations? Explain with sketch Frank-Read sources of dislocations.	**02+03+02**
	(b)	Explain different Techniques for observation of dislocation	**07**
		OR	
	(b)	List strengthening mechanisms in solids. Explain any two with schematic diagrams.	**03+04**
Q.3	**(a)**	Define Plastic deformation. Explain plastic deformation in polycrystalline materials	**03+04**
	(b)	Why annealing is done after cold working? Explain recovery, recrystallization and grain growth	**03+04**
		OR	
Q.3	**(a)**	Differentiate between Edge and screw dislocation	**07**
	(b)	Which test is used to measure toughness? Explain any one method	**03+04**
Q.4	**(a)**	Define Brittle fracture. Describe mechanism of Brittle fracture propagation	**04+03**
	(b)	Derive formula for critical resolved shear stress? Explain its importance in plastic deformation	**04+03**
		OR	
Q.4	**(a)**	Define Hardness. Explain Rockwell Hardness Test method. Mention Advantages and limitations of this method.	**02+02+03**
	(b)	Write a note on Micro Hardness Test. Give the applications	**04+03**
Q.5	**(a)**	What do you mean by Calibration? Why the calibration of Testing-Instruments is required? Explain by help of proper examples	**02+02+03**
	(b)	What is Creep? Explain the creep curve & factors affecting creep strength	**03+04**
		OR	
Q.5	**(a)**	Define Fatigue. Explain mechanism of fatigue in metals. What are main factors affecting fatigue properties of materials.	**02+03+02**
	(b)	Describe the creep testing procedure with neat schematic.	**07**

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