Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV(OLD) • EXAMINATION – WINTER 2016

Subject Code:142103 Date:23/11/2016

Subject Name:Mechanical Behaviour And Testing Of Materials

Time:02:30 PM to 05:00 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)**	Draw Stress-strain diagram for brittle and ductile material and label it properly. Define the following: - 1. Young's Modulus 2. Ductility 3. Toughness 4. Breaking Strength.	**07**
	(b)	What is Ductile-brittle transitions behavior and its significance. ? draw Suitable diagram	**03+04**
Q.2	**(a)**	Differentiate between Engineering stress-strain curve & True stress- strain curve	**07**
	(b)	Differentiate between plastic deformation by slip and twinning	**07**
		OR	
	(b)	Discuss the strengthening mechanism in metals and alloys?	**07**
Q.3	**(a)**	Classify types of testing methods. State criteria for selection of testing method giving examples for selection of the method.	**03+04**
	(b)	Explain Brinell Hardness Test method and list its advantages & limitations.	**07**
		OR	
Q.3	**(a)**	What is the effect of cold working on the properties of metals? Explain with suitable diagram various stages of Annealing process	**04+03**
	(b)	Explain with sketch Frank-Read sources of dislocations	**07**
Q.4	**(a)**	Define Brittle fracture. Describe mechanism of Brittle fracture propagation	**03+04**
	(b)	Define the following Terms. With suitable Diagram (Any three) 1. Dislocation climb 2. Pinning .3. Critical resolved shear Stress.4. Slip plane	**07**
		OR	
Q.4	**(a)**	Explain different Techniques for observation of dislocation	**07**
	(b)	Which tests is used to measure toughness? Explain any one method	**02+04**
Q.5	**(a)**	What do you mean by Calibration? Why the calibration of Testing-Instruments is required? Explain by help of proper examples	**02+03+02**
	(b)	Discuss –Super plasticity.	**07**
		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)	What is Creep? Draw labelled Creep Curve. Explain three stages of Creep.	**03+04**

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