

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**BE - SEMESTER-III (New) EXAMINATION – WINTER 2015**

**Subject Code:2132104****Date:23/12/2015****Subject Name: Testing of Metals and Alloys****Time: 2:30pm to 5:00pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

		MARKS
<b>Q.1</b>	<b>Short Questions</b>	<b>14</b>
	1 Define Ductility.	
	2 Toughness is measured as	
	3 Define young's Modulus.	
	4 Define Strain.	
	5 Write formula of % Elongation.	
	6 Write formula of % Reduction in area.	
	7 Define Resilience.	
	8 Yield strength is _____	
	9 Define Impact strength.	
	10 Define Hardness.	
	11 Define creep.	
	12 Define the Fatigue life.	
	13 Define Fatigue strength.	
	14 Fatigue limit is _____	
<b>Q.2</b>	(a) Explain the criteria for selection of testing method.	<b>03</b>
	(b) 'Testing of material is an important task for industry' - justify comment.	<b>04</b>
	(c) What is calibration of instruments? Discuss the importance of calibration of testing instruments.	<b>07</b>
	<b>OR</b>	
	(c) Write a note on effect of temperature and strain rate on flow properties.	<b>07</b>
<b>Q.3</b>	(a) Explain about yield point phenomena.	<b>03</b>
	(b) Discuss true stress-strain curve.	<b>04</b>
	(c) Explain the Brinell Hardness Test Procedure in detail. Mention Limitations.	<b>07</b>
	<b>OR</b>	
<b>Q.3</b>	(a) Discuss about Scratch Hardness test.	<b>03</b>
	(b) What do you understand by rebound Hardness test? Mention limitations.	<b>04</b>
	(c) Discuss about Vicker Hardness Test method. Enlist advantages & limitations.	<b>07</b>
<b>Q.4</b>	(a) Differentiate between ductile and brittle fracture.	<b>03</b>
	(b) Give Mechanism of cup and cone type fracture.	<b>04</b>
	(c) Describe Charpy Impact test. Derive Relationship for energy	<b>07</b>

absorbed by specimen.

**OR**

- Q.4** (a) Draw a typical creep curve and label it. **03**  
(b) Discuss important features of fatigue failure. **04**  
(c) Write a note on Mechanism of creep deformation in metals. **07**

- Q.5** (a) Enlist different Rockwell scales with indenter used. **03**  
(b) Explain Izod impact test. **04**  
(c) Differentiate between ferrous alloys and non ferrous alloys with reference to their respective S-N curves. **07**

**OR**

- Q.5** (a) Mention Factors affecting Impact Test. **03**  
(b) Discuss Factors affecting creep behavior. **04**  
(c) Write a note on fatigue Mechanisms in metals. **07**

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