Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III • EXAMINATION – WINTER 2013

Subject Code: 132101 **Date: 07-12-2013**

Subject Name: Elements of Material Science and Metallurgy

Time: 02.30 pm - 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)**	Define metallurgy. Describe Various fields of metallurgy.	**07**
	(b)	What is corrosion? Differentiate in wet and dry corrosion. List different losses due to corrosion.	**07**
Q.2	**(a)**	Give the classification of engineering materials. Explain the criteria for selection of materials for engineering applications.	**07**
	(b)	What is imperfection? Discuss different crystals imperfections in brief.	**07**
		OR	
	(b)	Explain the effects of grain size, heat treatment and alloying elements on properties of single phase material.	**07**
Q.3	**(a)**	Define and classify refractory. Discuss the general requirements of a refractory material with proper examples.	**07**
	(b)	Classify testing methods. Explain X-ray Radiography testing method.	**07**
		OR	
Q.3	**(a)**	What is ceramic? Describe the Structure and Properties of Ceramics.	**07**
	(b)	Define Hardness. Explain Brinell Hardness method.	**07**
Q.4	**(a)**	What is metallic coating? Explain the mechanism of corrosion protection by noble coating and active coating with suitable examples.	**07**
	(b)	What are polymers? Discuss the Polymerization mechanisms.	**07**
		OR	
Q.4	**(a)**	Define composite. Compare the metal matrix and ceramic matrix composites.	**07**
	(b)	Write a note on Liquid crystal displays.	**07**
Q.5	**(a)**	What is a Moulding? Draw and explain a flow chart showing major foundry activities.	**07**
	(b)	What do you mean by powder metallurgy? Discuss advantages, limitations and applications of powder metallurgy.	**07**
		OR	
Q.5	(a)	Define brazing. Explain basic steps of brazing. Give applications.	**07**
	(b)	List the important Copper ores. Explain the principles of Copper production.	**07**

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