Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III • EXAMINATION – SUMMER • 2014

Subject Code: 132101 **Date: 04-06-2014**

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 material science and Metallurgy and explain requirements of Engineering Materials	**07**
	(b)	Explain classification of Engineering materials with suitable examples.	**07**
Q.2	**(a)**	Explain imperfections in crystals.	**07**
	(b)	Write classification of refractory and discuss the general requirements of a Refractory material with examples.	**07**
		OR	
	(b)	Explain the effects of heat treatment and alloying elements on properties of single phase material.	**07**
Q.3	**(a)**	What is polymer? Explain polymerization mechanism with sketch.	**07**
	(b)	What is composite? Explain comparison between metal matrix and ceramic matrix composite.	**07**
		OR	
Q.3	**(a)**	Differentiate between n-type and p-type semi conductors.	**07**
	(b)	Write a short note on Piezoelectric materials.	**07**
Q.4	**(a)**	Explain various fields of metallurgical engineering.	**07**
	(b)	List the important Copper ores. Explain the principles of Copper production.	**07**
		OR	
Q.4	**(a)**	What is powder metallurgy? Write advantage and limitations and applications of powder metallurgy.	**07**
	(b)	Explain any one casting method with sketch.	**07**
Q.5	**(a)**	Explain principle used in soldering and brazing.	**07**
	(b)	What is the difference between destructive and non-destructive testing? Explain any one non-destructive test with sketch.	**07**
		OR	
Q.5	**(a)**	Explain X-ray radiography with sketch.	**07**
	(b)	What is corrosion? Explain any one corrosion prevention method.	**07**

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