Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– III (NEW) EXAMINATION – SUMMER 2015

Subject code: 2132101 **Date:27/06/2015**

Subject Name: Elements of Metallurgy

Time:02.30pm-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 'Metallurgy'. What are the important fields of Metallurgical Engineering?	**04**
	(b)	Give the classification of engineering materials. Explain the criteria for selection of materials for engineering applications.	**10**
Q.2	**(a)**	What is corrosion? Differentiate in wet and dry corrosion. List different losses due to corrosion.	**07**
	(b)	Explain the effects of grain size, heat treatment and alloying elements on properties of single phase material.	**07**
		OR	
	(b)	What is imperfection? Discuss different crystals imperfections in brief.	**07**
Q.3	**(a)**	What is a Polymer? What do you mean by Polymerization? Name at least four different types of polymers & their uses.	**07**
	(b)	Define and classify refractory. Discuss the general requirements of a refractory material with proper examples.	**07**
		OR	
Q.3	**(a)**	Explain the mechanism of addition, condensation & Co-polymerization.	**07**
	(b)	What are the methods for joining of metals? Write the Principle & application of fusion welding 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 is ceramic? Describe the Structure and Properties of Ceramics.	**04**
		OR	
Q.4	**(a)**	i) How do you define Composite materials? Give examples of composite materials highlighting their importance.	**04**
		ii) Define the following properties. (i) Ductility (ii) Toughness (iii) Fatigue	**03**
	(b)	Define Hardness. Explain Brinell Hardness method.	**07**
Q.5	**(a)**	What do you mean by powder metallurgy? Discuss advantages, limitations and applications of powder metallurgy.	**07**
	(b)	i) What is a foundry? Give a general classification of foundry	**04**
		ii) Define the following : Malleability ,Resilience , Creep	**03**
		OR	
Q.5	**(a)**	What do you mean by Destructive testing & Non destructive testing? Enlist important NDT techniques & explain the principle & application of any one testing technique.	**10**
	(b)	Give the definition of 'Metal'. Draw stress –strain curve for mild steel & cast iron, & highlight the difference.	**04**

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