Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– IV • EXAMINATION – SUMMER 2015

Subject Code: 142104 **Date: 08/06/2015**

Subject Name: Metallurgy for Non metallurgists

Time: 10.30am-01.00pm **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 Hardness and Toughness. Explain allotropy with suitable examples.	**07**
	(b)	Explain in detailed about Iron – Carbon equilibrium Diagram using neat sketch.	**07**
Q.2	**(a)**	Mention properties and applications of stainless steels. Give its general composition.	**07**
	(b)	Discuss various Heat treatment processes of Aluminium alloys.	**07**
		OR	
	(b)	Discuss effect of different alloying elements on the properties of steel.	**07**
Q.3	**(a)**	What do you mean by Material Testing? Justify its need for industry. Classify material testing methods.	**07**
	(b)	Write the types of cast irons. Mention the properties and applications of Malleable cast iron.	**07**
		OR	
Q.3	**(a)**	Enlist various NDT methods. Explain the Dye penetration testing method.	**07**
	(b)	Define casting. Explain the Die casting method.	**07**
Q.4	**(a)**	Define hardenability. Explain Jominy end quench hardenability test.	**07**
	(b)	Write a note on Forging.	**07**
		OR	
Q.4	**(a)**	What is TTT diagram? Explain its use in heat treatment using suitable example.	**07**
	(b)	Enlist different metal forming processes. Describe different rolling mills.	**07**
Q.5	**(a)**	Define corrosion. Discuss about Uniform corrosion. Enlist methods of Corrosion prevention.	**07**
	(b)	What is Welding? Explain SAW welding process.	**07**
		OR	
Q.5	**(a)**	What is failure? Discuss the causes of material failure and general practices carried out in failure analysis.	**07**
	(b)	Compare the SMAW and GTAW welding process.	**07**

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