Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV • EXAMINATION – SUMMER • 2014

Subject Code: 142104 **Date: 25-06-2014**

Subject Name: Metallurgy for Non Metallurgist

Time: 10:30 am - 01:00 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)**	Draw the Iron–Iron Carbide phase diagram. Explain all important reactions.	**07**
	(b)	Explain the FCC and HCP structure. Calculate atomic packing factor of both.	**07**
Q.2	**(a)**	What is carburizing? Discuss the pack carburizing process.	**07**
	(b)	Write a note on Heat treatment processes of Aluminum alloys.	**07**
		OR	
	(b)	Define heat treatment. List various heat treatment processes and discuss any one.	**07**
Q.3	**(a)**	Define steel. Describe the properties and applications of stainless steel.	**07**
	(b)	Define and explain: 1. Creep 2. Tensile Strength 3 Toughness	**07**
		OR	
Q.3	**(a)**	Define Welding. Explain GTAW welding process.	**07**
	(b)	Define Hardenability. Explain Jominy end quench test for hardenability measurement.	**07**
Q.4	**(a)**	Define Cast iron. Write properties and applications of white cast iron.	**07**
	(b)	List different metal forming processes. Describe the Extrusion method.	**07**
		OR	
Q.4	**(a)**	Define casting. Explain the Investment casting method.	**07**
	(b)	Differentiate in detail between Cold and Hot working processes.	**07**
Q.5	**(a)**	What do you mean by metals failure during service? Write a note on Failure due to Fatigue.	**07**
	(b)	What are TTT diagrams? Describe the effect of alloying elements on TTT diagram.	**07**
		OR	
Q.5	**(a)**	Define corrosion. List different types of corrosion. Explain any one method of corrosion prevention.	**07**
	(b)	List NDT methods. Explain any one NDT method.	**07**

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