Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV (OLD) - EXAMINATION – SUMMER 2017

Subject Code: 142104 **Date: 12/06/2017**

Subject Name: Metallurgy For Non-Metallurgists

Time: 10:30 AM to 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)**	What is failure? Describe causes of failure and general practices carried out in failure analysis.	**07**
	(b)	Define corrosion. Enlist different types of corrosion. Explain one prevention method of corrosion.	**07**
Q.2	**(a)**	Discuss Heat treatment processes of Aluminum alloys.	**07**
	(b)	Explain the mean of crystal planes and crystal directions. With neat diagram indicate close packed directions of BCC and FCC materials.	**07**
		OR	
	(b)	Draw and explain Iron–Iron Carbide equilibrium diagram. Label all components properly.	**07**
Q.3	**(a)**	Briefly explain the effect of various alloying elements on the properties of steel.	**07**
	(b)	Explain Jominy end quench test for hardenability measurement.	**07**
		OR	
Q.3	**(a)**	What do you mean by plain carbon steel? Discuss about advantages and limitations of plain carbon steel.	**07**
	(b)	What is TTT diagram? Describe the effect of alloying elements on TTT diagram.	**07**
Q.4	**(a)**	Give the classification of Cast iron. Mention the properties and applications of ductile cast iron.	**07**
	(b)	Define rolling. Discuss different rolling mills.	**07**
		OR	
Q.4	**(a)**	Describe Investment casting method.	**07**
	(b)	Write a note on Extrusion and Swaging at high temperature.	**07**
Q.5	**(a)**	Explain the GMAW welding process.	**07**
	(b)	Describe the Ultrasonic testing method.	**07**
		OR	
Q.5	**(a)**	Explain the submerged arc welding process.	**07**
	(b)	What are main purposes of testing of materials? List mechanical and NDT tests. Explain Dye Penetrant Test.	**07**

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