Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– VI • EXAMINATION – SUMMER 2015

Subject Code: 162105 **Date: 12/05/2015**

Subject Name: Electrometallurgy & Corrosion

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 Galvanizing. Explain Galvanizing Process. Give advantage & application of Galvanizing.	**07**
	(b)	Explain mechanism of inter granular corrosion in stainless steel. Describe methods to prevent it in stainless steel.	**07**
Q.2	**(a)**	Describe the significance of high temperature corrosion study. Discuss Piling-Bedworth ratio and its applications.	**07**
	(b)	Explain factors affecting corrosion. Discuss the effect of temperature, velocity and pH on corrosion rate.	**07**
		OR	
	(b)	Define corrosion rate. Explain tafel extrapolation method for corrosion rate measurement.	**07**
Q.3	**(a)**	"Corrosion is reverse of extractive metallurgy" Discuss. Give the importance of corrosion study.	**07**
	(b)	What do you understand by pitting corrosion? Discuss the factors which increase pitting and its possible remedial measures.	**07**
		OR	
Q.3	**(a)**	What is electroplating? Explain important steps involved in electroplating. Give applications.	**07**
	(b)	What is selective leaching? Discuss its causes and possible remedial measures with suitable examples.	**07**
Q.4	**(a)**	Derive Nernst equation for electrode potential. Show how the electrode potential of Hydrogen electrode will vary with pH at one atmospheric pressure.	**07**
	(b)	Explain electrochemical theory of wet corrosion with suitable examples. Why Small anodic area results in intense corrosion.	**07**
		OR	
Q.4	**(a)**	Define polarization. Enlist different types of polarization. Discuss about activation polarization.	**07**
	(b)	Discuss the Pourbaix diagram for a Metal-H_2O system and show that how it is useful in corrosion study.	**07**
Q.5	**(a)**	Explain the role of design aspects in corrosion protection. Write a note on alteration of environment for corrosion prevention.	**07**
	(b)	Discuss the role of sacrificial anode in corrosion protection. Explain sacrificial anode cathodic protection method.	**07**
		OR	
Q.5	**(a)**	What are inhibitors? With the help of proper examples, differentiate between cathodic and anodic inhibitors.	**07**
	(b)	By using examples, explain how material selection is helpful to combat corrosion in chemical industries.	**07**

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