Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE – SEMESTER – VI EXAMINATION – WINTER 2015

Subject Code:162105 **Date:10/12/ 2015**

Subject Name: Electrometallurgy & Corrosion

Time:2:30pm to 5:00pm **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 corrosion. Discuss about various factors affecting corrosion rate? Why corrosion should be prevented?	**07**
	(b)	Explain the following: 1. Faraday's laws 2. Anode 3. Cathode 4. Current Density	**07**
Q.2	**(a)**	Write Piling-Bedworth ratio. Discuss its importance and applications in corrosion study	**07**
	(b)	Discuss the Pourbaix diagram for Fe-H_2O system and show that how it is useful in corrosion study	**07**
		OR	
	(b)	With proper examples explain how material selection is helpful to combat corrosion in automobile industries.	**07**
Q.3	**(a)**	Mention applications and limitations of Nernst's equation.	**07**
	(b)	When Intergranular corrosion occurs? Explain its mechanism and ways of prevention.	**07**
		OR	
Q.3	**(a)**	What do you understand by pitting corrosion? Give the factors which increase pitting. Describe the different ways of prevention from pitting.	**07**
	(b)	What is galvanic series? Discuss its applicability and limitations in corrosion studies. Compare it with e.m.f. series.	**07**
Q.4	**(a)**	Discuss about concentration polarization. Differentiate between concentration polarization and activation polarization.	**07**
	(b)	Define Galvanizing. Explain Galvanizing Process. Give advantage and application of Galvanizing.	**07**
		OR	
Q.4	**(a)**	What are inhibitors? Discuss different types of inhibitors with suitable example and their ways of functioning	**07**
	(b)	What is the principle of anodic and cathodic protection? Compare both techniques	**07**
Q.5	**(a)**	Describe anodizing process & explain the characteristics of Anodizing coatings.	**07**
	(b)	Discuss causes and mechanism of stress corrosion cracking. Suggest and explain possible remedial measures against it.	**07**
		OR	
Q.5	**(a)**	Discuss mechanism of erosion corrosion. Mention the causes and way of combating erosion corrosion	**07**
	(b)	What do you mean by high temperature corrosion? Suggest suitable materials used for high temperature applications.	**07**