Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V • EXAMINATION – SUMMER • 2014

Subject Code: 152105 Date: 24-06-2014

Subject Name: Industrial Corrosion and Its Prevention

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)**	Explain electrochemical theory of wet corrosion with suitable examples.	**07**
	(b)	Define galvanic corrosion. Discuss its causes, mechanism and way of prevention.	**07**
Q.2	**(a)**	Discuss about galvanic series. Compare it with emf series.	**07**
	(b)	Explain concentration polarization. Differentiate between concentration polarization and activation polarization.	**07**
		OR	
	(b)	Define corrosion. Discuss the importance of corrosion behavior study for metals and alloys.	**07**
Q.3	**(a)**	Explain mechanism of inter granular corrosion. Describe methods to prevent it in stainless steel.	**07**
	(b)	Discuss effect of water quality on corrosion rate in thermal power plants.	**07**
		OR	
Q.3	**(a)**	Discuss causes, mechanism and way of prevention of crevice corrosion.	**07**
	(b)	Explain in brief about cooling water system with suitable figure.	**07**
Q.4	**(a)**	Derive Nernst equation for electrode potential. Discuss its application in corrosion study.	**07**
	(b)	Explain tafel extrapolation method for corrosion rate measurement.	**07**
		OR	
Q.4	**(a)**	Discuss the significance of high temperature corrosion study. Write Piling-Bedworth ratio and its applications.	**07**
	(b)	Explain Wet loss method for corrosion rate measurement.	**07**
Q.5	**(a)**	What is Metallic coating? Explain the difference between corrosion protection by noble coating and active coating using proper examples.	**07**
	(b)	With the help of suitable examples, on thermodynamic basis explain how the proper material selection is helpful in corrosion control.	**07**
		OR	
Q.5	**(a)**	Describe electroplating of copper. Explain process affecting factors.	**07**
	(b)	Compare cathodic protection method with anodic protection method to combat corrosion.	**07**

****