Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V • EXAMINATION – SUMMER 2013

Subject Code: 152105 Date: 23-05-2013

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)**	What is galvanic series? Discuss its importance in corrosion studies. Compare it with emf series.	**07**
	(b)	What do you mean by stress corrosion cracking? Mention the causes of stress corrosion. Discuss different methods of prevention from stress corrosion.	**07**
Q.2	**(a)**	Define corrosion. Explain mechanism of dry and wet corrosion.	**07**
	(b)	Define and explain exchange current density. How it is related to Faradayôs Law? Also mention factors affecting exchange current density.	**07**
		OR	
	(b)	Discuss about concentration polarization. Compare it with activation polarization.	**07**
Q.3	**(a)**	Describe the causes and possible remedies of galvanic and crevice corrosion.	**07**
	(b)	With the help of suitable examples explain the effect of corrosion on power equipments. Also mention the method to minimize corrosion in power equipments.	**07**
		OR	
Q.3	**(a)**	Define inter granular corrosion and explain its mechanism. Describe methods to control inter granular corrosion in stainless steel.	**07**
	(b)	With the help of proper examples, explain that how the inhibitors are helpful in corrosion control. Differentiate between organic and anodic inhibitors.	**07**
Q.4	**(a)**	Explain importance of corrosion study. Describe the electro-chemical principle of corrosion.	**07**
	(b)	Classify the electrochemical methods of corrosion testing. Discuss the limitations and applications of each of them.	**07**
		OR	
Q.4	**(a)**	Showing practical cases explain the high temperature corrosion process. Give the role of Piling-Bedworth ratio in high temperature corrosion study.	**07**
Q.4	**(b)**	Compare Tafel extrapolation method with Linear polarization method for the determination of corrosion rate. State the application of the latter method.	**07**
Q.5	**(a)**	Explain different methods of application of organic coating and point out their relative advantage and limitations.	**07**
	(b)	Classify different practical processes of corrosion control. With the help of suitable examples explain on thermodynamic basis, how the proper material selection is helpful in corrosion control.	**07**
		OR	
Q.5	**(a)**	Compare the operation, mechanism, advantages and disadvantages of hot dipping process with metal spraying process.	**07**
	(b)	Explain cathodic protection method for corrosion control. Differentiate between sacrificial anode cathodic protection method and impressed current cathodic protection method.	**07**

****