Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

B.E. Sem-Vth Examination December 2010

Subject code: 152105

Subject Name: Industrial Corrosion & Its Prevention

Date: 21 /12 /2010 **Time: 03.00 pm - 05.30 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)**	Define corrosion. Derive Nearnst equation..	**07**
	(b)	Explain why mild steel passivate in concentrated HNO_3 and not in dilute HNO_3.Explain it by using relevant figures and equations relating oxidizing characteristics of solution and electrode potentials.	**07**
Q.2	**(a)**	Discuss the combine polarization with η vs. log i plot.	**07**
	(b)	Explain different damages due to corrosion and give different anodic – cathodic reactions	**07**
		OR	
	(b)	Define 'cell' and give statements of Faradays law. Also explain a Daniel cell with figure.	**07**
Q.3	**(a)**	What is cell potential? Derive a cell potential of Cu – Zn & Cu – Ag.	**07**
	(b)	Explain how to construct Standard Hydrogen Electrode (SHE) with help of figures	**07**
		OR	
Q.3	**(a)**	Explain Inter Granular Corrosion with its principle, mechanism & preventing methods.	**07**
	(b)	Short note on Stress Corrosion.	**07**
Q.4	**(a)**	What is polarization? Explain any one in detail.	**07**
	(b)	What is limiting current density? Explain exchanged current density in detail.	**07**
		OR	
Q.4	**(a)**	Explain corrosion due to biological deposits (fouling) with figure.	**07**
	(b)	Discuss the influence of water quality on corrosivity in thermal power plants.	**07**
Q.5	**(a)**	Explain Pilling – Bedworth ratio. Also give different high temperature oxidation rate laws with W Vs. t plot.	**07**
	(b)	Write on conventional metallic and other inorganic coating methods with suitable examples.	**07**
		OR	
Q.5	**(a)**	Explain the pitting corrosion testing by ASTM G 48 and ASTM G 61-78 techniques.	**07**
	(b)	Describe the cathodic protection with figures. Also shortly explain stray current effect and remedial steps.	**07**

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