Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE – SEMESTER – VI (NEW).EXAMINATION – WINTER 2016

Subject Code: 2162108 **Date: 26/10/2016**

Subject Name: Material Degradation and Prevention

Time: 10:30 AM to 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)**	Define Corrosion & explain electrochemical theory of wet corrosion	**2+5**
	(b)	Give the importance of corrosion study; including cost of corrosion	**07**
Q.2	**(a)**	Derive Nernst equation for electrode potential. Show how the electrode potential of Hydrogen electrode will vary with pH at one atmospheric pressure	**5+2**
	(b)	Write a short note on the Ag-AgCl and Calomel reference electrode.	**7**
		OR	
	(b)	Compare between E.M.F. & Galvanic series for corrosion studies	**7**
Q.3	**(a)**	What is intergranular corrosion? Compare between Knife Line Attack & Weld Decay	**3+4**
	(b)	Write Piling-Bedworth ratio and its applications	**7**
		OR	
Q.3	**(a)**	Explain use of material selection to combat corrosion in high temperature conditions.	**7**
	(b)	Justify the role of design aspects in corrosion protection with suitable examples	**7**
Q.4	**(a)**	Explain in brief the various types of Inhibitors used for corrosion protection, with suitable examples. Differentiate between cathodic and anodic inhibitors	**4+3**
	(b)	During electroplating, pH of bath is strictly maintained. Give reason.	**7**
		OR	
Q.4	**(a)**	What is anodizing? Give applications	**7**
	(b)	Explain how rusting of iron is prevented by galvanization	**7**
Q.5	**(a)**	What do you mean by Tafel plot? Explain the use of Tafel plot in corrosion rate measurement	**3+4**
	(b)	Explain how material selection is helpful to combat corrosion in Automobile Sector.	**7**
		OR	
Q.5	**(a)**	What is Wear? What are the methods to improve wear resistance? Give suitable examples.	**2+5**
	(b)	Discuss the Wear Measurement Technique with Necessary schematics.	**7**

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