Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– VI (New) EXAMINATION – WINTER 2019

Subject Code: 2162108 **Date: 11/12/2019**

Subject Name: Material Degradation and Prevention

Time: 02:30 PM TO 05:00 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 are different reference electrodes? Define anode and cathode.	**03**
	(b)	What is polarization? Discuss in briefly.	**04**
	(c)	What is pitting corrosion? Discuss its mechanism and prevention.	**07**
Q.2	**(a)**	What are factors affecting corrosion? Discuss any one.	**03**
	(b)	What is passivity? Briefly explain.	**04**
	(c)	With suitable example discuss sacrificial anode and impressed current as method of cathodic protection.	**07**
		OR	
	(c)	Discuss friction stir processing as method of surface composite manufacturing.	**07**
Q.3	**(a)**	What are different ways of corrosion rate measurement? Explain in short.	**03**
	(b)	Discuss limitations of emf series.	**04**
	(c)	With reference to 18-8 Stainless steel, discuss intergranular corrosion and ways to combat it.	**07**
		OR	
Q.3	**(a)**	Explain current density and its role in corrosion.	**03**
	(b)	Discuss faraday's law of electrolysis.	**04**
	(c)	Material Selection and design plays an important role in corrosion protection. Justify statement with suitable example.	**07**
Q.4	**(a)**	Differentiate between wet and dry corrosion.	**03**
	(b)	Explain area and distance effect in galvanic corrosion.	**04**
	(c)	Discuss how inhibitors and passivators are used to combat corrosion.	**07**
		OR	
Q.4	**(a)**	Briefly explain uniform corrosion.	**03**
	(b)	Briefly discuss pin on disc method for wear measurement.	**04**
	(c)	Write brief note on sputtering and ion implanting.	**07**
Q.5	**(a)**	Define wear and list analytical methods of wear.	**03**
	(b)	Explain how galvanizing help to combat corrosion of steel.	**04**
	(c)	Discuss chemical vapor deposition (CVD) in detail.	**07**
		OR	
Q.5	**(a)**	Explain Pilling Bedworth ratio	**03**
	(b)	Discuss prevention of high temperature corrosion.	**04**
	(c)	Discuss physical vapor deposition (PVD) in detail.	**07**

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