

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER-V (NEW) EXAMINATION – WINTER 2024****Subject Code:3152116****Date:25-11-2024****Subject Name:Environmental Degradation of Materials****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.
4. Simple and non-programmable scientific calculators are allowed.

		MARKS
Q.1	(a) Define corrosion. Describe the importance of corrosion study.	03
	(b) Discuss the effect of anodic area and pH on corrosion rate.	04
	(c) Explain electrochemical theory of wet corrosion with suitable examples of anodic and cathodic reactions.	07
Q.2	(a) Define wear and list types of wear.	03
	(b) “Any reduction in wear can result in substantial savings”. Comment.	04
	(c) Define Passivity. Discuss using example of Fe piece in HNO ₃ .	07
OR		
Q.3	(c) List different types of polarization. Describe the activation polarization.	07
	(a) Write a short note on Calomel reference electrode.	03
	(b) “Corrosion is reverse of extractive metallurgy” Comment.	04
	(c) Describe the Pourbaix diagram for Fe-Water system and its use in corrosion study.	07
OR		
Q.3	(a) Discuss mechanism of Abrasive wear.	03
	(b) Discuss applications of galvanic series in corrosion studies.	04
	(c) Derive Nernst equation for electrode potential. Describe its use in corrosion study.	07
Q.4	(a) Describe methods to prevent inter granular corrosion in stainless steel.	03
	(b) Explain mechanism of inter granular corrosion in stainless steel.	04
	(c) Discuss mechanism and way of prevention of erosion corrosion.	07
OR		
Q.4	(a) Explain prevention methods against galvanic corrosion.	03
	(b) “Pitting is most dangerous form of corrosion” Comment.	04
	(c) Describe mechanism and way of prevention of crevice corrosion.	07
Q.5	(a) Give advantage & application of Galvanizing.	03
	(b) Write a brief note on alteration of environment for corrosion prevention.	04
	(c) Explain sacrificial anode cathodic protection method to combat corrosion.	07
OR		
Q.5	(a) Discuss the advantages of thermal spraying coating.	03
	(b) Justify the design aspects in corrosion protection with few examples.	04
	(c) Describe electroplating. Explain factors affecting electrodeposition.	07
