

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-V EXAMINATION – SUMMER 2025****Subject Code:3152116****Date:13-05-2025****Subject Name:Environmental Degradation of Materials****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.
4. Simple and non-programmable scientific calculators are allowed.

		Marks
Q.1	(a) With example explain the term corrosion.	03
	(b) State reactions when piece of zinc and copper metal is placed in two separate beaker containing hydrochloric acid. Also, state reactions when zinc and copper are electrically connected.	04
	(c) Write detailed note on galvanic corrosion.	07
Q.2	(a) Explain term corrosion rate. List methods to measure.	03
	(b) Design of equipment does not affect its corrosion behavior. Give your comment and justify.	04
	(c) Write detailed note on anodic prevention.	07
OR		
	(c) Enlist reference electrodes used in corrosion study. With neat sketch briefly explain any one.	07
Q.3	(a) Define or explain the term: anode, cathode and half cell potential	03
	(b) With suitable example explain phenomena of de-alloying.	04
	(c) Write detailed short note on Pitting corrosion with their cause, mechanism and preventive suggestions.	07
OR		
Q.3	(a) What is meant by passivity? List material showing passivity behavior.	03
	(b) Draw neat sketch of passivity curve and explain.	04
	(c) What is hydrogen damage? Explain it briefly.	07
Q.4	(a) With suitable example establish that corrosion can be prevented with coating.	03
	(b) List methods of coating. Explain any one.	04
	(c) List different cathodic prevention methods for corrosion. Discuss in detail.	07
OR		
Q.4	(a) With example classify corrosion based on temperature.	03
	(b) Controlling environment can help to alter corrosion of metal. Defend statement with suitable example.	04
	(c) What is meant by polarization? Explain in detail.	07
Q.5	(a) Explain uniform corrosion with suitable example.	03
	(b) Predict and Briefly explain type of corrosion if metal pipeline carries slurry with suspended solids.	04
	(c) Explain corrosion behavior of weld of (i) sensitized stainless steel and (ii) stabilized stainless steel.	07

OR

- Q.5** (a) Define wear. List materials and their characteristics to improve wear. **03**
(b) Briefly explain wear measurement. **04**
(c) With neat sketch explain Pourbaix diagram for metal water system. **07**
