

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VIII(NEW) EXAMINATION – SUMMER 2019****Subject Code: 2182112****Date:13/05/2019****Subject Name: Industrial Corrosion, Testing, Prevention & Control****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.

		MARKS
<b>Q.1</b>	(a) Discuss the importance of study the corrosion behavior of metals and alloys.	<b>03</b>
	(b) Justify the role of design aspects in corrosion protection.	<b>04</b>
	(c) Corrosion failure occurs in car engine cooling system. Identify the possible causes and suggest remedies.	<b>07</b>
<b>Q.2</b>	(a) Discuss factors affecting life of exhaust valve of a heavy duty natural gas engine.	<b>03</b>
	(b) Describe Failure modes of exhaust valve of a heavy duty natural gas engine.	<b>04</b>
	(c) Using proper examples discuss microbial induced corrosion (MIC). Discuss different bacteria controlling MIC rate. Suggest suitable remedial measures.	<b>07</b>
<b>OR</b>		
	(c) Discuss failure analysis of medium capacity boiler tube used in power plant including causes and remedies.	<b>07</b>
<b>Q.3</b>	(a) Solution annealing is a tool to prevent IGC. Discuss.	<b>03</b>
	(b) List major forms of corrosion may occur in oil and gas production industries.	<b>04</b>
	(c) Corrosion failure occurs in a 316 SS drain pipe line in a refinery. Identify the Causes and suggest remedies with investigation methodology adopted.	<b>07</b>
<b>OR</b>		
<b>Q.3</b>	(a) Suggest some candidate materials to be used in corrosive environment in petrochemical industries. .	<b>03</b>
	(b) Write a note on corrosive environment in petrochemical industries.	<b>04</b>
	(c) Pitting Corrosion Failure occurs in a wet gas pipeline used in petrochemical plant in south Iran. Explain investigation methodology adopted to identify the Causes. Suggest remedies.	<b>07</b>
<b>Q.4</b>	(a) Suggest suitable corrosion resistant material for hull of boat.	<b>03</b>
	(b) Explain role of ductile brittle transition temperature in corrosion failures.	<b>04</b>
	(c) Corrosion fatigue failure occurs in a marine vessel shaft coupling made by cast Iron and used in ship's propulsion system. Identify the Causes and explain investigation methodology used. Suggest remedies.	<b>07</b>
<b>OR</b>		
<b>Q.4</b>	(a) “Pitting is most dangerous form of corrosion” Discuss.	<b>03</b>
	(b) Suggest preventive measures for corrosion failures in helical compression spring of automobile suspension system.	<b>04</b>
	(c) Selecting proper examples explain how material selection is helpful to combat corrosion in ship building industries.	<b>07</b>
<b>Q.5</b>	(a) Describe causes of corrosion in automobile battery terminal.	<b>03</b>

(b) Describe the corrosion resistance materials, can be used in Automobile industries. **04**

(c) Reformer tube of an Ammonia plant fails. Explain with investigation methodology adopted to Identify the causes and suggest remedies. **07**

**OR**

**Q.5** (a) Suggest material for heat exchanger tube in a fertilizer plant to protect corrosion damage **03**

(b) From a metallurgical engineer point of view describe the causes of Bhopal gas tragedy. **04**

(c) Failure occurs of a reboiler in the waste water stripping tower of a petrochemical plant. Identify the Causes and suggest remedies. **07**

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