

	P.E.S. COLLEGE OF ENGINEERING (AN AUTONOMOUS INSTITUTE) CHH. SAMBAJINAGAR-431002 Regular Summer Examination – 2026 Course: F.Y.M.Tech. Branch : Structural Engineering Semester :II Subject Code & Name: MTPESSE202T– Retrofitting of Structures Max Marks: 60 	
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Q. 3	Solve Any one of the following.														
A)	Explain the causes of brittle failure in steel structures and describe the tests used for detecting defects in welded joints. Solution:- Marking Scheme <table><tr><th>Content</th><th>Marks Distribution</th></tr><tr><td>Introduction to brittle failure</td><td>2</td></tr><tr><td>Causes of brittle failure</td><td>3</td></tr><tr><td>Defects in welded joints</td><td>2</td></tr><tr><td>Tests for detecting weld defects</td><td>4</td></tr><tr><td>Conclusion</td><td>1</td></tr></table>	Content	Marks Distribution	Introduction to brittle failure	2	Causes of brittle failure	3	Defects in welded joints	2	Tests for detecting weld defects	4	Conclusion	1	K3	12
Content	Marks Distribution														
Introduction to brittle failure	2														
Causes of brittle failure	3														
Defects in welded joints	2														
Tests for detecting weld defects	4														
Conclusion	1														
B)	Discuss the mechanism of corrosion in steel structures and explain the application of cathodic protection and corrosion inhibitors. Solution:- Marking Scheme <table><tr><th>Content</th><th>Marks Distribution</th></tr><tr><td>Mechanism of corrosion</td><td>4</td></tr><tr><td>Corrosion inhibitors</td><td>3</td></tr><tr><td>Cathodic protection method</td><td>3</td></tr><tr><td>Practical applications</td><td>1</td></tr><tr><td>Conclusion</td><td>1</td></tr></table>	Content	Marks Distribution	Mechanism of corrosion	4	Corrosion inhibitors	3	Cathodic protection method	3	Practical applications	1	Conclusion	1	K3	12
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Conclusion	1														
Q.4	Solve Any one of the following.														
A)	Analyze the essential parameters required for selecting suitable repair materials for deteriorated reinforced concrete structures exposed to marine environmental conditions. Solution:- Marking Scheme <table><tr><th>Content</th><th>Marks Distribution</th></tr><tr><td>Introduction to repair material requirements</td><td>2</td></tr><tr><td>Identification of essential parameters</td><td>4</td></tr><tr><td>Analysis of marine exposure effects</td><td>4</td></tr><tr><td>Selection justification and conclusion</td><td>2</td></tr></table>	Content	Marks Distribution	Introduction to repair material requirements	2	Identification of essential parameters	4	Analysis of marine exposure effects	4	Selection justification and conclusion	2	K4	12		
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Introduction to repair material requirements	2														
Identification of essential parameters	4														
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B)	Analyze the performance of Premixed Cement Concrete and Mortar in comparison with conventional site-mixed repair materials for structural rehabilitation works. Solution:- Marking Scheme <table><tr><th>Content</th><th>Marks Distribution</th></tr><tr><td>Introduction to premixed and conventional materials</td><td>2</td></tr><tr><td>Comparison of properties and performance</td><td>4</td></tr><tr><td>Analysis of advantages and limitations</td><td>4</td></tr><tr><td>Conclusion</td><td>2</td></tr></table>	Content	Marks Distribution	Introduction to premixed and conventional materials	2	Comparison of properties and performance	4	Analysis of advantages and limitations	4	Conclusion	2	K4	12		
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Analysis of advantages and limitations	4														
Conclusion	2														
Q. 5	Solve Any one of the following.														
A)	Analyze the various causes of deterioration in reinforced concrete structures and evaluate appropriate testing techniques for identifying structural distress.. Solution:- Marking Scheme <table><tr><th>Content</th><th>Marks Distribution</th></tr><tr><td>Introduction to structural deterioration</td><td>2</td></tr><tr><td>Analysis of causes of deterioration</td><td>4</td></tr><tr><td>Evaluation of testing techniques</td><td>4</td></tr><tr><td>Conclusion</td><td>2</td></tr></table>	Content	Marks Distribution	Introduction to structural deterioration	2	Analysis of causes of deterioration	4	Evaluation of testing techniques	4	Conclusion	2	K4	12		
Content	Marks Distribution														
Introduction to structural deterioration	2														
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Evaluation of testing techniques	4														
Conclusion	2														
B)	Explain the role of surface impregnation, rust eliminators, and polymer coatings for reinforcement protection during repair works. Solution:- Marking Scheme <table><tr><th>Content</th><th>Marks Distribution</th></tr><tr><td>Introduction to protective treatments</td><td>2</td></tr><tr><td>Explanation of surface impregnation</td><td>3</td></tr><tr><td>Role of rust eliminators and polymer coatings</td><td>4</td></tr><tr><td>Advantages and practical significance</td><td>3</td></tr></table>	Content	Marks Distribution	Introduction to protective treatments	2	Explanation of surface impregnation	3	Role of rust eliminators and polymer coatings	4	Advantages and practical significance	3	K2	12		
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Introduction to protective treatments	2														
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