

**GUJARAT TECHNOLOGICAL UNIVERSITY**

**BE- SEMESTER-VII EXAMINATION – WINTER 2025**

**Subject Code:3170616**

**Date:20-11-2025**

**Subject Name:Retrofitting of structures**

**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.**

|            |   | <b>MARKS</b> |
|------------|---|--------------|
| <b>Q.1</b> | (a) What exactly is a condition evaluation? List the objectives of the condition evaluation.                                      | <b>03</b>    |
|            | (b) Explain Day to Day repair as per CPWD.  | <b>04</b>    |
|            | (c) Enlist various construction errors which lead to the deterioration of concrete structure. Explain any one of them in detail.  | <b>07</b>    |
| <b>Q.2</b> | (a) Explain Routine and Periodic maintenance.   | <b>03</b>    |
|            | (b) Explain repair to be carried out for leakage from terrace.  | <b>04</b>    |
|            | (c) Explain with neat sketches the different types of cracking observed in various RCC elements such as beams, slabs and columns. | <b>07</b>    |
|            | <b>OR</b>   |              |
|            | (c) Write in short on weathering effect freezing and thawing on RCC structure.  | <b>07</b>    |
| <b>Q.3</b> | (a) Write short note about vacuum concrete.   | <b>03</b>    |
|            | (b) Write a short note on the fiber wrap method.  | <b>04</b>    |
|            | (c) Explain the durability of concrete in detail.   | <b>07</b>    |
|            | <b>OR</b>   |              |
| <b>Q.3</b> | (a) Explain on polymer impregnated concrete (PIC).  | <b>03</b>    |
|            | (b) Enlist classifications of repair materials  | <b>04</b>    |
|            | (c) Differentiate: (i) Repair and Retrofitting (ii) Active crack and Passive crack (iii) Drying shrinkage and Plastic shrinkage   | <b>07</b>    |
| <b>Q.4</b> | (a) Write a short note on procedure of Guniting.  | <b>03</b>    |
|            | (b) Explain the procedure to ensure Quality control in Concrete construction.   | <b>04</b>    |
|            | (c) Enlist types of shoring and explain raking shore with sketch.   | <b>07</b>    |
|            | <b>OR</b>   |              |
| <b>Q.4</b> | (a) Explain injection grouting for RCC buildings.   | <b>03</b>    |
|            | (b) Differentiate: (i) Porosity and Permeability (ii) Destructive testing and Non-destructive testing                             | <b>04</b>    |
|            | (c) List down the different Non-destructive testing methods and explain the working principle of any one of the NDT test method   | <b>07</b>    |
| <b>Q.5</b> | (a) Enlist out various physical and chemical deteriorations   | <b>03</b>    |
|            | (b) Write a short note on fiber reinforced concrete.  | <b>04</b>    |
|            | (c) Explain the importance of a concrete cover in an RCC structure. Provide IS:456 guidelines for nominal cover.                  | <b>07</b>    |

**OR**

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|------------|------------|--|-----------|
| <b>Q.5</b> | <b>(a)</b> | Enlist causes of distress in reinforced concrete structures.                               | <b>03</b> |
|            | <b>(b)</b> | Write various thermal properties of concrete and explain coefficient of thermal expansion. | <b>04</b> |
|            | <b>(c)</b> | Elaborate Alkali-aggregate reaction in detail.   | <b>07</b> |

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