

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2021****Subject Code:3170616****Date:15/12/2021****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.

| | | MARKS |
|------------|--|--------------|
| Q.1 | (a) What is a condition assessment? Give main objectives of condition assessment. | 03 |
| | (b) Explain need of concrete cover in RCC structure. Give IS:456-2000 recommendations for nominal cover. | 04 |
| | (c) Explain various types of maintenance. | 07 |
| Q.2 | (a) Enlist causes of distress in reinforced concrete structures. | 03 |
| | (b) Explain injection grouting for RCC buildings. | 04 |
| | (c) Explain weathering effect freezing and thawing on RCC structure. | 07 |
| | OR | |
| | (c) List out various construction errors which leads to the deterioration of concrete structure. | 07 |
| Q.3 | (a) List out various physical and chemical deteriorations. | 03 |
| | (b) Give various classifications of repair materials. | 04 |
| | (c) Explain RCC jacking and also explain column jacking with neat sketch. | 07 |
| | OR | |
| Q.3 | (a) Enlist various types of Non- Destructive Tests. | 03 |
| | (b) Explain effect of Acid attack on concrete element. | 04 |
| | (c) Write short note on Fiber Reinforced Concrete. | 07 |
| Q.4 | (a) Write short note on polymer impregnated concrete. | 03 |
| | (b) Write short note on vacuum concrete. | 04 |
| | (c) Explain the corrosion of reinforcement in RCC structure. | 07 |
| | OR | |
| Q.4 | (a) Define (i) Repair (ii) Restoration (iii) Retrofitting | 03 |
| | (b) Write short note on Guniting. | 04 |
| | (c) Explain the durability of concrete in detail. | 07 |
| Q.5 | (a) Enlist various thermal properties of concrete and explain coefficient of thermal expansion. | 03 |
| | (b) How to carry out repairs of leakage from terrace? | 04 |
| | (c) Give various types of shoring and explain raking shore with sketch. | 07 |
| | OR | |
| Q.5 | (a) Explain Day to Day repair. | 03 |
| | (b) Write short note on Fibre Wrap Technique. | 04 |
| | (c) Enlist various crack repair techniques and explain crack repair by stitching. | 07 |

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VII (NEW) EXAMINATION – SUMMER 2022

Subject Code:3170616

Date:08/06/2022

Subject Name:Retrofitting of structures

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) Define the following terms: (i) Durability of concrete (ii) Deterioration (iii) Retrofitting | 03 |
| | (b) Give a broad classification of various types of deterioration as observed in Reinforced concrete structures | 04 |
| | (c) Enlist various Construction and design errors that lead to fatal failure of structures. | 07 |
| Q.2 | (a) Justify the need of performing the condition evaluation/structural appraisal of the structure during its life time. | 03 |
| | (b) Differentiate between the following terms: (Any two) (i) Repair and Retrofitting (ii) Active crack and Passive crack (iii) Drying shrinkage and Plastic shrinkage (iv) Destructive testing and Non-destructive testing (v) Porosity and Permeability | 04 |
| | (c) Describe with neat sketches the different types of cracking observed in various RCC elements such as beams, slabs and columns. | 07 |
| | OR | |
| | (c) Enlist and explain the different clauses in accordance with IS 456 to ensure the durability of the construction. | 07 |
| Q.3 | (a) List down the different Non-destructive testing methods and explain the working principle of any one of the NDT test method. | 03 |
| | (b) List down the various factors to be considered while selecting repair method and steps to be followed to carry out an effective repair. | 04 |
| | (c) Define Condition Assessment. Mention the various objectives of the condition assessment of structures. | 07 |
| | OR | |
| Q.3 | (a) Enlist various types of chemical and physical deterioration seen in concrete structures. | 03 |
| | (b) Write a short note on procedure of Guniting. | 04 |
| | (c) Enlist various strengthening methods for beams and slabs. Explain one strengthening method in detail for both beam and slab. | 07 |
| Q.4 | (a) List down various parameters which you will keep in mind while assessing the cracks in RCC members. | 03 |
| | (b) Write a short note on Transport Mechanism of fluids into the concrete. | 04 |
| | (c) Define Alkali-aggregate reaction and explain it in detail. | 07 |

OR

- Q.4** (a) Mention various signs of distress seen in deteriorated concrete structure. **03**
(b) How would you ensure Quality control in Concrete construction. **04**
(c) Explain the Mechanism of Corrosion in concrete structures. **07**

- Q.5** (a) What steps will you follow to correct a deflected RCC slab. **03**
(b) List down the various techniques to strengthen the Foundation. **04**
(c) Write a short-note on Under-water repairs. **07**

OR

- Q.5** (a) Explain Routine and Periodic maintenance. **03**
(b) Explain the procedure of Stitching or Resin injection for repair of cracks. **04**
(c) Mention the major points of difference between a New construction work and repair/strengthening work. **07**
