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**

****