

GUJARAT TECHNOLOGICAL UNIVERSITY
M. E. - SEMESTER – II • EXAMINATION – SUMMER • 2013

Subject code: 1721506**Date: 05-06-2013****Subject Name: Rehabilitation and Retrofitting of Buildings****Time: 10.30 am – 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.

Q.1 (a) What do you understand by the term Durability. What precautions will you take to maintain durability of structure. Explain this in context to IS 456:2000 **04**

(b) Explain the transport mechanism of fluids in concrete. Explain role of water as a deteriorating agent. **07**

(c) State the difference in the approach and methodology adopted for execution of repair work against new construction. **03**

Q.2 (a) With respect to the corrosion of steel in concrete explain the significance of the following terms: **08**

- (i) Passivity of steel
- (ii) Electrochemical Process
- (iii) Expansion of concrete & Cracking
- (iv) Electrical Resistivity of Concrete

(b) Differentiate between the following (any three) **06**

- (i) Repair / Rehabilitation
- (ii) Strengthening / Retrofitting
- (iii) Porosity / Permeability
- (iv) Micro cracking / Macro cracking
- (v) Abrasion / Erosion
- (vi) Active repair / Passive repair

OR

(b) Describe the various retrofitting schemes for RCC columns or RCC beams for different types of structural **06**

Q.3 (a) State the classification of the defects in the stone and brick masonry. Explain each defect in detail. **07**

(b) Explain in detail the various steps required before carrying out the repair process. Explain Conditional evaluation in this context. **07**

OR

Q.3 (a) Which are various signs of distress in structure. Give the classification of the deterioration of concrete structures. Explain Abrasion, Erosion and Cavitation. **07**

(b) What are the various source of defects or flaws found in Steel Structures. 07
How would you assess or evaluate these defects.

- Q.4 (a) State the objectives and the methodology for Conditional assessment of the structure. 07
(b) Explain any 2 Non-Destructive tests carried out for the assessment of concrete strength in detail 07

OR

- Q.4 (a) Write Short notes on the following (any three) 14
1.Deterioration of Concrete by chemical reactions
2. Selection of repair material & repair strategy
3.Classification of repair and grouping of structural members in context to Conditional Assessment
4. Global and local deficiencies in structure
5. Alkali Silica Reaction
6. Active and Passive Corrosion

Q.5 (a) Relate the following Symptoms with the causes of distress and deterioration. More than one symptom can be related to the distress 07

Causes	Symptoms
1. Accidental loadings	Construction faults, cracking, Disintegration, distortion/movement, Erosion, Joint failures, Seepage, Spalling
2. Construction errors	
3. Corrosion	
4. Chemical reactions	
5. Design errors	
6. Freezing & thawing	
7. Settlement & Movement	

(b) State the various repair / rehabilitation strategies available to give relief to the distressed structure. Explain "Stress reduction method" in detail. 07

OR

- Q.5 (a) State the stages of repair. Explain "Concrete Removal & Surface preparation" in this context. 07
(b) Define Seismic Strengthening. Explain building performance levels and Attributes for better performance of the structures. 07
