Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – II • EXAMINATION – SUMMER • 2013

Subject code: 1722006 **Date: 03-06-2013**

Subject Name: Rehabilitation of Structures

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)** Define durability. Discuss all aspects of durability of concrete in detail. **07**

(b) Clearly mention, major reasons for corrosion of reinforcement embedded in concrete. Enumerate all code provisions and other methods to reduce the corrosion of steel in concrete. **07**

Q.2 **(a)** What are the effects of acid and sulfate attack on concrete? Which are the tests to measure the durability of concrete against acid and sulfate attack? Explain any one test in detail. **07**

(b) Define following terms with respect to concrete. **07**

1. Abrasion
2. Carbonation
3. Efflorescence
4. Erosion
5. Alkali- silica reaction
6. Freezing and thawing of concrete
7. Creep

OR

(b) Which are the modern materials used for mitigating the adverse effects of erosion, fatigue, abrasion and corrosion of RCC structures? Explain the exact role of admixtures and plasticizers used to improve the durability of concrete. **07**

Q.3 **(a)** What is non destructive testing of concrete? In what circumstances they are carried out? Explain any one non destructive method to determine the corrosion of steel in concrete in existing structures. **07**

(b) Explain with sketch the complete working principal of the rebound hammer test. Discuss benefits and limitations of this test. **07**

OR

Q.3 **(a)** Which are the tests to determine the tensile strength of concrete? Explain the pull off test in detail. **07**

(b) Which are the design aspects and material selection parameters for the off shore marine RCC structures? Explain with suitable example. **07**

Q.4 **(a)** Which are the major reasons for deterioration of buildings? Prepare a checklist for the health assessment of a building for defects and deterioration. **07**

(b) A masonry building is deteriorated due to the earthquake excitation. With neat sketches, explain methods for repairing the walls and corners with suitable examples. **07**

OR

Q.4 **(a)** Explain the terms for buildings clearly with appropriate examples in detail. **07**

1. Repair
2. Rehabilitation
3. Retrofitting

(b) Which are the Indian code provisions and guidelines for building planning and special provisions for masonry buildings to make them earthquake resistant? Draw the sketch for following as per the code. **07**

1. Openings in masonry buildings
2. RCC bands in masonry buildings

Q.5 **(a)** Explain the strengthening techniques for an RCC column of a low rise building severely damaged during the earthquake. Illustrate the method completely with neat sketch. **07**

(b) Which are the special materials used for repair and retrofitting work? Give examples for such materials for masonry, RCC and steel structures. **07**

OR

Q.5 **(a)** Explain push-over analysis in detail. Why it is carried out? When and how the results of push-over analysis could be useful? **07**

(b) Discuss the role of quality control as a preventive measure for buildings. Explain the maintenance work done for a steel structure with appropriate example. **07**

****