

6E 6038

Roll No. _____

[Total No. of Pages : 2]

6E6038

B.Tech. VI Semester (Main&Back) Examination, May-June 2015

Civil Engineering

6CE6.3A Repair & Rehabilitation of Structures

Time : 3 Hours

Maximum Marks : 80

Min. Passing Marks : 24

Instructions to Candidates:

Attempt any **five** questions, selecting **one** question from **each** unit. All questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Unit - I

1. a) Explain causes and mechanism of carbonation in concrete; and its effect. What is its significance in light of corrosion. (8)
- b) Explain 'abrasion', 'erosion' and 'putting' in concrete - causes, mechanism and preventive measures. (8)

OR

1. a) Explain with figures, crack patterns due to flexure, shear, separately in a reinforced concrete beam (4)
- b) Explain preventive measures for cracks due to 'plastic shrinkage' in concrete. (4)
- c) Explain effect of 'chloride ingress' in concrete, particularly significance in light of corrosion also describe preventive measures. (8)

Unit - II

2. a) Describe 'Penetration resistance' test and its utility. (4)
- b) Why 'ultrasonic pulse velocity' test and 'rebound hammer' test are generally used together. Discuss their respective principles and limitations, along with interpretation of results. (10)
- c) What is 'Rebar locator', explain its use (2)

OR

2. a) Explain the use of 'core cutting' method. Discuss interpretation of its results and correction factors for its correlation to equivalent cube strength as well as 'height-diameter' ratio of cores. (8)
- b) Explain 'resistivity' of concrete its unit and typical values for different concretes. How it is measured? How resistivity of concrete may be enhanced. (8)

Unit - III

3. a) Explain 'FRP'; its properties and application. (6)
- b) Explain 'Ferro cement' its properties, typical behaviour (4)
- c) Discuss advantages and disadvantages of 'Polymers and resins'. (6)

OR

3. a) Discuss 'GFRP' and 'CFRP'; their typical properties and selection criterion. (8)
- b) Discuss 'Bonding aspect' of different repair materials. (8)

Unit - IV

4. a) Discuss materials equipments, precautions and process etc. for 'Under water repair' (10)
- b) Explain material and equipments for 'grouting'. (6)

OR

4. a) Explain the situations in which 'Shotcrete' is used. Discuss its materials and processes. (8)
- b) Discuss the situations in which 'Externally bonded plates' are employed discuss its applications with figures. (8)

Unit - V

5. a) How 'distress' in buildings may be investigated and assessed through visual observations and 'Fast' methods? (8)
- b) Discuss how canals can be rehabilitated. (8)

OR

5. a) How bridge maintenance should be done? Discuss. (8)
- b) Describe 'Preliminary test methods' for investigation for structures. (8)