

Reg. No. :

Question Paper Code : 71538

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2017.

Eighth Semester

Civil Engineering

CE 6021 — REPAIR AND REHABILITATION OF STRUCTURES

(Regulations 2013)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List down the main objectives of maintenance of buildings.
2. State the causes of deterioration in reinforced concrete structures.
3. Distinguish between structural cracks and non-structural cracks with an example.
4. In what way carbonation of concrete affects the structures?
5. State the merits and applications of sulphur infiltrated concrete in construction practice.
6. Why fibre reinforced concrete is preferred in water retaining structures, blast resistant structures and repair and rehabilitation works?
7. Under what situations the use of underpinning is warranted?
8. Enumerate the advantages of cathodic protection system over conventional method of repetitive repair and replacement.
9. Write the typical ranges of Thermal conductivity, Thermal diffusivity, Specific heat, coefficient of thermal expansion of ordinary concrete.
10. List the pre-planning activities to be done before demolition of a structure.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain the various categories of inspection based on method and interval. (6)
- (ii) Draw a flowchart of the general approach adopted pre-repair evaluation of distress concrete structures. (10)

Or

- (b) (i) Prepare a report on damage classification of the structural members based on the output of preliminary investigation. (12)
- (ii) Differentiate between repair and rehabilitation of building. (4)
12. (a) (i) List the functions of quality control during concrete construction. (8)
- (ii) How materials, water-cement ratio, placement of reinforcing steel, formwork, curing, vibration and compaction influence the quality control of the structure? (8)

Or

- (b) (i) Explain the importance of concrete cover in RCC structures. Give recommendations of IS 456-2000 for nominal cover. (8)
- (ii) List various construction and design deficiency which causes distress in the RCC structure. (8)
13. (a) (i) Under what circumstances vacuum treatment is given to concrete? Explain with neat sketch the arrangement for vacuum treatment of concrete with its merits and applications in construction practice. (10)
- (ii) Summarize the sequence of operation in preparation of polymer-impregnated concrete elements. (6)

Or

- (b) Explain briefly the materials, mechanisms and behavior of fresh and hardened state of High performance concrete. Also indicate their merits and demerits in construction practice.
14. (a) (i) List the significance of performance and integrity test on concrete and explain any one method in detail. (8)
- (ii) How to estimate the strength of concrete in existing structure? Explain the method in which the longitudinal pulse velocity (km/s) is used to predict the quality of concrete. (8)

Or

- (b) (i) Write the step by step procedure adopted in epoxy injection for repair works. (8)
- (ii) Enumerate the types of shoring and describe the use of raking shore under the following :
- (1) To support unsafe walls for a building, with the height of 12 meters
- (2) To support unsafe walls of a building with height of 8 meters. (8)
15. (a) (i) Explain the procedure for demolishing main structural members like columns, beams and slabs with the help of neat sketch. (12)
- (ii) What are the allied activities accompanying the demolition process? (4)

Or

- (b) (i) Under what condition strengthening of foundation is required? Explain how columns strengthened by section enlargement technique with the help of neat sketch? (8)
- (ii) What are the precautions to be taken to prevent water leakage in roofs/flat roofs and sunken floors in toilet? (8)