

B.E/B.Tech Degree Examination November/December 2012

Eight Semester/Civil Engineering

**CE2071/CE811/080100066-REPAIR AND REHABILITATION OF
STRUCTURES**

(Regulation 2008)

Time: Three Hours

Maximum: 100 marks

ANSWER ALL QUESTION

PART - A ($10 \times 2 = 20$ marks)

1. What is preventive maintenance?

- The maintenance work done before the defects occurred or damage developed in the structure is called preventive maintenance.
- This operation includes through inspection, planning the program of maintenance and executing the work.
- It depends upon the specifications, conditions and use of structure.

2. Name the reasons for deterioration of concrete?

- Design and construction flaws
- Environmental effects
- Poor quality material used
- Quality of supervision
- Deterioration due to corrosion

3. What is the effect of fire on concrete?

Most fire damaged structure can be repaired. The forms of structural damages caused by fire.

- Spalling of concrete
- Strength reduction in concrete and steel
- Loss of anchorage of reinforcement
- Excessive deflection in beams and slab
- Distortion (Deformation) of the whole structural forming

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4. What is the result of poor construction practices?

- Adequate compaction of concrete
- Effective curing
- Production of impervious concrete
- Effective grouting of pre-stressed tendons
- Periodical maintenance

5. What are the basic needs for selection of repair materials?

- It should be durable
- It is high workability
- It should be cheap and best
- It should be free from chemical impurities

6. List the type of polymer concrete composites?

- Polymer impregnated concrete (PIC)
- Polymer cement concrete (PCC)
- Polymer Concrete (PC)
- Partially impregnated and surface coat. 0Polymer impregnated concrete (PIC)

7. What are the advantages of shotcrete?

Shotcrete has high strength, durability, low permeability, excellent bond and limitless shape possibilities. These properties allow shotcrete to be used in most cases as a structural material. Although the hardened properties of shotcrete are similar to conventional cast-in-place concrete, the nature of the placement process provides additional benefits, such as excellent bond with most substrates and instant or rapid capabilities, particularly on complex forms or shapes.

In addition to building homes, shotcrete can also be used to build swimming pools.

8. What you mean by underpinning?

It is the method of supporting structures while providing new foundation or carrying out repairs and alterations without disturbing the stability of the existing structures.

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9. List the methods to overcome low member strength in concrete structures?

- Increasing the depth with reinforcement.
- Increasing the width.
- Providing an overlay.
- Bonding with metal plates.
- Use of external clamps. Use of steel plates.

10. What is the preventive measure to be adopted to make the structure stable against marine exposure?

- Concrete piles, Bridge pier - affected on surface or corrosion of reinforcement.
- Piles for repair were subjected to breaking out of all areas of deduce concrete. This was continued until steel was found at both ends of the breakout.
- Where any longitudinal bar had lost more than 10 percent of its original area through corrosion, new reinforcement was added alongside.

PART - B (5 × 16 = 80 marks)

11. (a) Explain the various facets of maintenance. Explain briefly the various causes for deterioration of concrete?

Refer Unit I - Section 1.2.2 & Section 1.7

[OR]

(b) Describe the assessment procedure for evaluating a damaged structure. Briefly explain the importance of maintenance of structures?

Refer Unit I - Section 1.6.3 & Section 1.1.1

12. (a) How quality assurance plays an important role in construction industry. Explain the parameters affecting the quality of concrete construction?

Refer Unit II - Section 2.1

[OR]

(b) What is meant by corrosion of rebars? Discuss the factors influencing corrosion. Explain the behavior of concrete structures due to faulty design and construction errors?

Refer Unit IV - Section 4.39

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13. (a) Explain the behavior of steel fiber reinforced concrete as a repair materials
How Ferro cement can be used as a material for repair?

Refer Unit III Page 3.39

[OR]

- (b) Discuss the use of concrete chemicals to enhance the performance of concrete.
Explain the types of polymer concrete composites with their advantages?

Refer Unit III Section 3.5

14. (a) Explain in detail the procedure of epoxy coating of rebars. Give the procedure
of epoxy injection to structural crack repair in RC structural elements?

Refer Unit IV Section 4.3

[OR]

- (b) Explain in detail the various types of demolition techniques?

Refer Chapter V Section 5.6

15. (a) How do you strengthen the various structural elements? Explain in detail with
sketches?

Refer Unit V Section 5.2

[OR]

- (b) Explain the methods used for fire protection in RC buildings. Discuss the sea
water attack on concrete?

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