B.E/B.Tech Degree Examination November/December 2013

Eight Semester/Civil Engineering

REPAIR AND REHABILITATION OF STRUCTURES

(Regulation 2008)

Time: Three Hours Maximum: 100 marks

ANSWER ALL QUESTION

PART - A (10 × 2 = 20 marks)

1. What are the causes of deterioration?

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

2. Give the necessity and importance of maintenance.

- Prevention of damages and decay caused due to natural agencies wear and tear to keep then in good working condition and appearance for the intended join.
- Repair of defects developed in the structure and strengthens them.

3. What is the role of cover in RC structures?

- Increase durability and struch
- It prevents reinforcement from the atmospheric agent
- lt precasts reinforce from corrosion.

4. Define "durable concrete"?

- Durable concrete performs good in its life; in its service environment. Its ingredient materials are durable. Its mix, matrix and integrity workmanship are perfect. Further it is protected from corrosion, deterioration, cracking, etc.

5. Write short notes on ferro-cement?

- Ferro-cement is a new material consisting of wire meshes and cement mortar.

- The wire mesh is usually of 0.5 to 1.0mm dia wire at 5mm to 10mm spacing and cement mortar is of cement sand ratio of 1:2 or 1:3 with water/cement ratio of 0.4 to 0.45.
- The Ferro-cement elements are usually of the order of thickness is 2 to 3mm external cover to the reinforcement.
- The steel content varies between 300kg to 500 kg/m^3.

6. What are the application of special concrete?

- This self-weight will make it to some extend an uneconomical structural material.
- It helps reduce the dead load, increase the progress of building and lowers the transportation and handling cost.Light weight concrete have low thermal conductivity
- The high density. Concrete is used in construction of radiation shields. They are effective and economic construction material for permanent shielding purpose.

7. How do repair the cracks by dry pack?

- Dry packing so the hand placement of a very dry mortar and the subsequent tamping of the mortar into place, producing an intimate contact between the new and existing works.
- Because of the low water cement ratio of the material there is little shrinkage and the patch remains tight. The usual; mortar mix is 1:2:5 to 1:3.

8. Give the method of corrosion protection techniques.

- Costing to reinforcement
- Galvanized reinforcement
- Improving metallurgicallly addition of certain elements
- Using stainless steel
- Using non-ferrous reinforcement
- Using corrosion inhibitors
- Cathodic protection either by means of impressed unit or by sacrificial anodes
- Electrochemical chloride removal

- Improving the cover concrete

9. What are chemical disruptions involved in concrete structures?

- Alkali aggregate reaction
- Sulphate Attack
- Aggressive water

10. How do arrest the leakage in RC structures?

- Epoxy resin injection
- Chemical coating
- Crack injection method

PART-B (5 × 16 = 80 marks)

11. a) Explain the damages assessment procedure for evaluating the damaged structures with flow chart diagram?

Refer Unit I - Section 1.6.3

[OR]

b) What is maintenance? Explain the facets and importance of maintenance with various inspection procedures?

Refer Unit I - Section 1.1

12. a) Relate serviceability and durability of concrete structures under the heading of quality assurance in concrete?

Refer Unit II - Section 2.1

[OR]

b) Explain about the design and construction errors in RC structures with remedial measures?

Refer Unit II - Section

13. a) Discuss the functional classification and requirements of repair materials with various aspects.

Refer Unit II - Section 3.5

[OR]

b) Explain the function and application of polymer concrete, and fiber reinforced concrete as repair material?

Refer Unit III - Section 3.3

14. a) What are the techniques available to demolish the structures? Explain any one with detailed case study?

[OR]

b) Write short note on:

1) Epoxy injection

Refer Chapter V Section 5.2.3

2) Cathodic protections

Refer Chapter VII Section 7.8

3) Vacuum concrete

Refer Chapter V Page 7.41

15. a) How do you repair various types of cracks? Explain with neat sketch?

Refer Chapter 6 Section 6.10

[OR]

b) Explain about the jacketing and plate bounding techniques in rehabilitation to overcome the low member strength?

Refer Chapter V Section 5.2.3

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