B.E/B.Tech Degree Examination May/June 2012

Eight Semester/Civil Engineering

REPAIR AND REHABILITATION OF STRUCTURES

(Regulation 2008)

Time: Three Hours Maximum: 100 marks

ANSWER ALL QUESTIONS

PART-A (10 × 2=20 marks)

1. **Distinguish between Repair and Rehabilitation?**

Repair:

Repair is the process of restoring something that is damaged or deteriorated or broken, to good condition Rehabilitation:

Rehabilitation is the process of returning a building or an area to its previous good conditions.

2. **Write the importance of maintenance?**
   - Improve the life of structure
   - Better appearance
   - Ensures safety occupants
   - Ensures feeling of confidence of the users
3. **Explain the importance of "coefficient of thermal expansion" with respect to strength of concrete.**
4. **Discuss briefly the effects due to "climate"?**

It has a great effect on the life of human beings the basic elements which constitute the climate of a place are:

- Air temperature and solar radiation
- Rainfall
- Wind
- Humidity

The variation of climate leads to Expansion and contraction in structural members which leads to cracks in Structure.

5. **Classify cracks based on its thickness?**

Fine : Width less than 0.1 mm Thin : Width 0.1mm to 0.3mm Medium : Width 0.3mm to 0.7mm Wide : Width 0.7mm to 2.0mm Very wide: Width greater than 2mm

Cracks may be uniform width throughout or may be narrow at one end, gradually widening at the other. Cracks may be straight toothed, stepped, map pattern or random and may be vertical, horizontal or diagonal

6. **What are the application of expansive cement?**

A slight change in volume drying is known as expansive with time will prove to be advantage for grouting purpose. This type of cement which suffers no overall change in volume on dry cement concrete.

8. **What is a dry pack?**

Dry pack is the hand placement of a very dry mortar and subsequent tamping or ramming of the mortar into place producing an intimate contact between the old and new concrete work.

9. **What are the characteristics of good coatings?**

10. **What do you mean by weathering corrosion?**

PART - B (5 × 16 = 80 marks)

11. (a) With a graph explain the service life behavior of a concrete structure. Also explain in detail about time based maintenance?

Refer Unit I - Section 1.1

[OR]

(b) Explain the causes and effects of any four defects in concrete structure?

Refer Unit I - Section 1.7.1

12. (a) With chemical equations, explain the mechanism of corrosion?

Refer Unit II - Section 2.3.4

[OR]

(b) With sketches explain the possible design and constructional errors?

Refer Unit II - Section

13. (a) Explain in detail about the special materials manufacturing procedure and application of polymer modified concrete?

[OR]

(b) With respect to fibre reinforced concrete explain aspect ratio and volume fraction. Also explain their effects on fresh and hardened concrete properties. Explain with its stress-strain curve?

Refer Unit III Page 3.41

14. (a) Explain in detail:

i. Foamed concrete

ii. Vacuum concrete

Refer Unit IV Page 4.46

[OR]

(b) Explain in detail any two corrosion protection method?

15. (a) With sketches explain how do you improve the load bearing capacity of columns and beams?

Refer Unit V Section 5.2.5

[OR]

(b) How do you repair and rehabilitate a structure distressed due to fire?

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