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Question Paper Code: 52961

M.E. DEGREE EXAMINATION, JUNE 2016

Elective

Structural Engineering

15PSE502 - FORENSIC ENGINEERING AND REHABILITATION OF STRUCTURES

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. Corrosion of metals involves
 - (a) Physical reactions
 - (b) Chemical reactions
 - (c) Both
 - (d) None
2. For quality control of portland cement, the test essentially done is
 - (a) Setting time
 - (b) Soundness
 - (c) Consistency
 - (d) All the above.
3. The commercial name of white and coloured cement in India, is _____
 - (a) colocrete
 - (b) snowcem
 - (c) silvicrete
 - (d) all the above
4. Guniting is mechanically applied material consisting of _____
 - (a) aggregates
 - (b) cement
 - (c) both (a) and (b)
 - (d) none
5. After casting an ordinary cement concrete on drying
 - (a) expands
 - (b) mix
 - (c) shrinks
 - (d) none

PART B - (5 x 3 = 15 Marks)

6. What is meant by cathodic protection?
7. How does the maintenance differ from repair?
8. Write down the significance of the expansive cement.
9. What are the rust eliminators?
10. Give the limitation of non-destructive testing.

PART C - (5 x 16 = 80 Marks)

11. (a) (i) Explain the different types of design and construction errors in detail. (8)
(ii) Deliberate the code provision with respect to durability of the concrete. (8)

Or

- (b) (i) Elaborate the corrosion mechanism of steel in concrete with neat sketch. (8)
(ii) Explain the role of corrosion inhibitors. (8)
12. (a) (i) Explain the step by step procedure involving the assessment of structure subjected fire. (8)
(ii) Explain the deterioration mechanism involving in the concrete due to carbonation. (8)

Or

- (b) (i) Elaborate the necessity to maintain the concrete structure. (8)
(ii) How do you inspect the building subjected to cyclone? (8)
13. (a) (i) Explain the step by step procedure involving the fabrication of ferro cement. (8)
(ii) Write the review note on role of fibre in concrete. (8)

Or

- (b) (i) Compare the physical and mechanical properties of polymer concrete and Sulphur infiltrated concrete. (8)
(ii) Make a short review note on "Admixtures in Concrete". (8)

14. (a) (i) Describe the roll of rust eliminators in construction industry. (8)
(ii) Explain any two types of rust eliminators. (8)

Or

- (b) (i) Compare the gunite and shotcrete with respect to preparation and application point of view. (8)
(ii) Describe the importance and challenges in shoring and underpinning. (8)
15. (a) The span of the R.C.C beam length of 3.5 *m* and its cross section of beam is 300 *mm* x 450 *mm*. And its carry of 10% of load greater than that of allowable load. During the physical verification the crack was found in the near to the support. Give the suitable technique to strength the beam. And also find the type of failure. (16)

Or

- (b) (i) Explain the various non - destructive testing methods in civil engineering practices. (8)
(ii) The age of water tank 50 years which is located main street in the Maduri city. As a civil engineer to suggest suitable solution through the systematic diagram for demolish the water tank without disturb to surroundings. (8)
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