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Question Paper Code: 12065

M.E. DEGREE EXAMINATION, DECEMBER 2013.

First Semester

Structural Engineering

01PSE104 - ADVANCED CONCRETE TECHNOLOGY

(Regulation 2013)

Duration: Three hours

Maximum: 100 Marks

Use of mix design tables and charts may be permitted

Answer ALL Questions.

PART A - (10 x 2 = 20 Marks)

1. What is meant by grading of aggregates?
2. List out the various classification of admixtures.
3. Differentiate segregation and bleeding.
4. Mention the factors affecting durability of concrete.
5. Distinguish between nominal mix and design mix.
6. List out the effect of water cement ratio on strength of concrete.
7. Name some of the natural and artificial light weight aggregate.
8. List the applications of epoxy resins and screeds.
9. Define Bacterial concrete.
10. What is meant by extreme weather concreting?

PART - B (5 x 14 = 70 Marks)

11. (a) (i) Describe briefly about any two tests to be conducted on aggregates. (7)

(ii) Explain about role of admixtures in concrete. (7)

Or

(b) (i) Discuss about the types of cements available with their specific uses. (7)

(ii) Brief about various tests to be conducted to evaluate the quality of fine aggregate. (7)

12. (a) (i) Explain briefly about the factors affecting creep and shrinkage of concrete. (7)

(ii) Discuss about the mechanism of alkali aggregate reaction in concrete. (7)

Or

(b) What are the various methods to determine the workability of concrete? Compare these methods and bring out their limitations. (14)

13. (a) Design the concrete mix for the construction of residential building. Design the mix with the following specifications using I.S code:

Grade of concrete : M 25

Maximum size of aggregate : 20mm

Degree of workability : 0.9 compaction factor

Degree of quality control : Good

Specific gravity of cement : 3.14

Fine aggregate : 2.64

Coarse aggregate : 2.72

Assume any other data if required. (14)

Or

(b) (i) Discuss about the sampling and acceptance criteria for concrete. (10)

(ii) What are the different methods of mix design of concrete? (4)

14. (a) Write short notes on:

(i) Sulphur impregnated concrete. (3¹/₂)

(ii) Fibre reinforced concrete. (3¹/₂)

(iii) Light weight concrete. (3¹/₂)

(iv) Self curing concrete. (3¹/₂)

Or

(b) Explain about the characteristics and testing techniques for self compacting concrete. (14)

15. a) What are the objectives of curing of concrete? Briefly explain the different methods of curing of concrete. (14)

Or

(b) Explain in detail about,

(i) Vacuum dewatering (7)

(ii) Underwater concrete (7)

PART - C (1 x 10 = 10 Marks)

16. (a) Enumerate the properties and applications of Super plasticizers concrete. (10)

Or

(b) What do you understand by high performance concrete? Explain the classification of high performance concrete based on characteristic strength and durability. (10)