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Question Paper Code: BST205



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

M.Tech I Semester End Examinations (Supplementary) - July, 2017

Regulation: IARE-R16

ADVANCED CONCRETE TECHNOLOGY

(Structural Engineering)

Time: 3 Hours

Max Marks: 70

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

UNIT – I

- (a) What is meant by hydration of cement? Explain the hydration reaction of important Bogue's compounds indicating the products of hydration. [7M]

(b) Explain how you determine the strength of aggregate using aggregate crushing and impact value tests? [7M]
- (a) Explain in detail with sketches the structure of hydrated cement paste? [7M]

(b) What are Super plasticizers? Discuss the classification of Super plasticizers? What are the effects of Super plasticizers on Fresh Concrete? [7M]

UNIT – II

- (a) What are the causes of Bleeding and Segregation? Discuss the method of test for Bleeding of concrete? [7M]

(b) List the techniques for measuring Pulse velocity through concrete? Explain briefly the factors affecting the measurement of Pulse Velocity? [7M]
- (a) Explain briefly the various factors which affect the workability of concrete? [7M]

(b) Discuss maturity of concrete? How is it measured? What are its practical uses in the concrete industry? [7M]

UNIT – III

- (a) Explain how High-Strength concrete can be classified? What are the various techniques used to achieve high strength? [7M]

(b) What are the factors which control the performance of High Performance concrete? [7M]
- (a) What are the advantages and applications of using High-Strength concrete? [7M]

(b) What are the requirements for High-performance characteristics? Explain briefly the methods for achieving High-performance? [7M]

UNIT – IV

7. (a) Explain briefly the requirements for self-compacting concrete. Explain production and placing of self-compacting concrete. [6M]
- (b) What are the different types of fibers used in concrete? What are the factors effecting properties of fiber reinforced concrete? [8M]
8. (a) Explain the properties and applications of polymer impregnated concrete. [7M]
- (b) Explain in detail the method of design of light weight aggregate concrete mix. [7M]

UNIT – V

9. (a) List the various methods used for proportioning concrete mixes. Write any one procedure for determining concrete mix design. [7M]
- (b) Discuss the tests necessary to check the adoptability of a particular mix proportion for field use. [7M]
10. (a) What are the variables to be considered in proportioning of concrete mixes? Write a note on statistical quality control of concrete. [7M]
- (b) Design the concrete mix for M45 grade of concrete with the following data: [7M]
- Type of cement: OPC 43 grade
Maximum size of aggregate: 20 mm
Exposure condition: Severe (RCC)
Workability: 125 mm slump
Minimum cement content: 320 kg/m³
Maximum water cement ratio: 0.45
Method of placing concrete: pumping
Degree of supervision: good
Type of aggregate: Crushed angular aggregate
Super plasticizer will be used
Sp. Gr of CA: 2.80
Sp. Gr of FA: 2.70
Water absorption of CA: 0.5%
Water absorption of FA: 1%
Free surface moisture of CA: Nil
Free surface moisture of FA: Nil
Grading of CA conforming to Table 2 of IS 383
Grading of FA conforming to grading Zone 2.

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