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Question Paper Code: 55U07

Ph.D. COURSE WORK EXAMINATION, MAY 2018

Elective

Structural Engineering

15PSE507 – ADVANCED CONCRETE TECHNOLOGY

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

(IS 456: 2000, IS 10262:2009 and Charts from ACI 211.1-91-1991 and DOE1988 are permitted)

PART - A (5 x 1= 5 Marks)

1. Le- Chatelier apparatus is used to determine CO1- R
 - (a) Workability
 - (b) Soundness of cement
 - (c) Initial setting time
 - (d) Final setting Time

2. The increase of strain in concrete with time under sustained stress is termed as _____ CO2- R
 - (a) Creep
 - (b) Shrinkage
 - (c) Expansion
 - (d) Compression

3. The lowest grade of concrete specified in IS 456: 2000 for general R.C.C. work is CO3- R
 - (a) M15
 - (b) M20
 - (c) M10
 - (d) M40

4. J ring test is used to determine CO4- R
 - (a) Passing ability
 - (b) Density
 - (c) Flow ability
 - (d) Creep

5. The process of proper and accurate measurement of concrete ingredients for uniformity of proportion, is known as _____ CO5- R

- (a) Grading (b) Curing (c) Mixing (d) Batching

PART – B (5 x 3= 15Marks)

6. What is meant by hydration of cement? CO1- U
7. Define :Shrinkage cracking. CO2- U
8. What do you mean by Mix Design? CO3 -U
9. State the advantages of self compacting concrete. CO4- U
10. What is batching of concrete? CO5- U

PART – C (5 x 16= 80Marks)

11. (a) Discuss the need for admixtures in concrete and explain the various admixtures used to improve the workability of concrete. CO1-U (16)
Or
(b) How would you conduct the aggregate crushing value and impact value test? What are the acceptance criteria? CO1-U (16)
12. (a) Explain in detail any two types of tests for determining the workability of concrete. CO2- U (16)
Or
(b) Classify shrinkage and explain the different types of shrinkages. CO2- U (16)
13. (a) Discuss in detail the sampling and acceptance criteria of concrete as per ACI and IS Codes. CO3- U (16)
Or
(b) Design a concrete mix for M20 grade of concrete by DOE method for the following data: Fineness modulus of fine aggregate: 2.73, Fineness modulus of coarse aggregate: 7.6, Size of coarse aggregate: 20mm, Sieve analysis shows 47% passes through 600 μ sieve. Bulk Specific gravity of Coarse aggregate: 2.6. CO3- Ana (16)

14. (a) With neat sketches explain the various tests conducted to test the properties of fresh self compacting concrete. CO4- U (16)

Or

(b) Write short notes on

(i) Geopolymer concrete (Understand) (8 marks) CO4- U (8)

(ii) Sulphur Impreganated concrete (Understand) CO4- U (8)

15. (a) Explain in detail various techniques adopted for curing of concrete. CO5- U (16)

Or

(b) Enumerate and explain the problems that are encountered while concreting in hot weather. CO5- U (16)

