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Question Paper Code: 55U07

M.E. DEGREE EXAMINATION, APRIL 2019

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. The particular percentage of water which allows the plunger to penetrate to a depth of _____ is known as the percentage of water required to produce a cement paste of standard consistency. CO1- R
(a) 33-35 mm (b) 28-30 mm (c) 31-33 mm (d) 12-13 mm
2. The separation of the constituent materials of concrete is called CO2- R
(a) Bleeding (b) Creep (c) Shrinkage (d) Segregation
3. When the criterion imposed on a concrete mix is strength, it is called a CO3- R
(a) Prescribed mix (b) Design mix (c) Standard Mix (d) Nominal mix
4. J ring test is used to determine _____ CO4- R
(a) Passing ability (b) Density (c) Flowability (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= 15 Marks)

6. Define : Consistency of cement. CO1- U
7. State the conditions that are favorable for segregation. CO2-U

8. Distinguish between mean strength and target strength of concrete. CO3 -U
9. What is geopolymer concrete? CO4- U
10. What is the use of chute in concreting? CO5- U

PART – C (5 x 16= 80 Marks)

11. (a) How would you conduct the aggregate crushing value and impact value test? What are the acceptance criteria? CO1-U (16)
- Or
- (b) Explain the hydration process of cement mentioning the functions of Bogue's compounds. CO1-U (16)
12. (a) Make a comparative study on the slump test and compaction factor test and explain briefly the procedure and their limitations. CO2- U (16)
- Or
- (b) Explain in detail any two types of tests for determining the workability of concrete. CO2- U (16)
13. (a) Design a concrete mix for M20 grade concrete using IS recommended guidelines. Assume necessary data. CO3- App (16)
- Or
- (b) Design a concrete mix for M40 grade concrete using ACI recommended guidelines. Assume necessary data. CO3- App (16)
14. (a) Write short notes on CO4- U (8)
- (i) Polymer Concrete
- (ii) Sulphur Impregnated Concrete CO4- U (8)
- Or
- (b) With neat sketches explain the various tests conducted to test the properties of fresh self compacting concrete. CO4- U (16)
15. (a) Explain in detail various techniques adopted for curing of concrete. CO5- U (16)
- Or
- (b) Explain with neat sketches the tremie method of underwater concreting. CO5- U (16)