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Question Paper Code : 52730

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2019.

Sixth Semester

Civil Engineering

CE 6002 — CONCRETE TECHNOLOGY

(Regulation 2013)

Time : Three hours Maximum : 100 marks

(Use relevant Tables and Charts of IS: 10262-2009 and IS: 456-2000)

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Describe the role played by gypsum in the hydration reaction of cement.
2. Define fineness modulus? Give the practical range of fineness modulus for fine aggregate.
3. Which property of concrete can be modified by the addition of accelerators?
4. Write any two brand name of water proofing chemicals.
5. Write the concept of mix proportioning.
6. List out the variables in proportioning of concrete mix.
7. What kinds of slump observed in slump cone test?
8. Why is the age factor not taken advantage of in IS: 456-2000?
9. What are the applications of light weight concrete?
10. What are the different types of polymers added in concrete?

PART B — (5 × 13 = 65 marks)

11. (a) (i) Write a short note on Hydration of Cement.

(ii) What are the special applications of the following cements:

(1) Sulphate resisting Portland Cement

(2) Low heat Portland Cement.

Or

(b) How do you determine the crushing strength and toughness of aggregates.

12. (a) What kind of chemical admixture that can be added while concreting is done under

(i) Cold weather condition

(ii) Hot weather condition.

Or

(b) Explain in detail about any four mineral admixtures added in high performance concrete.

13. (a) Explain the step by step procedure of concrete mix design recommended by IS method.

Or

(b) Arrive the mix proportions for M20 concrete (RCC) exposed to Mild condition by IS method using the following details:

Design parameters:

(i) Max nominal size of aggregate: 20 mm

(ii) Degree of Workability :75 mm slump

(iii) Degree of Exposure : Mild

(iv) Method of concrete placing : Normal

(v) Shape of Coarse aggregate: Angular

(vi) Degree of quality control: Good

Data on Materials:

(i) Type of cement: OPC Grade 43

(ii) Specific Gravity of cement: 3.15

(iii) Specific Gravity of FA & CA: 2.65, 2.7 respectively

(iv) Free surface moisture: Nil for CA& FA.

(v) Fine aggregate: Confirming to grading zone II of table 4 of IS 383.

14. (a) What is meant by bleeding and segregation of concrete? What are the effects of bleeding and segregation in concrete? State the control measures to be taken to control it?

Or

(b) Explain in detail the factors influencing the strength of concrete.

15. (a) Write a short note on

(i) Structural Light weight concrete

(ii) Ferro cement.

Or

(b) Explain in detail about Polymer concrete, types and its applications.

PART C — (1 × 15 = 15 marks)

16. (a) Arrive the proportions of concrete (RCC) mix exposed to Severe condition by IS method using the following details:

Design parameters:

(i) Max nominal size of aggregate: 20 mm

(ii) Degree of Workability : 100 mm slump

(iii) Degree of Exposure : Severe

(iv) Method of concrete placing: Pumping

(v) Shape of Coarse aggregate : Angular

(vi) Degree of quality control: Good

Data on Materials:

(i) Type of cement : OPC Grade 53

(ii) Specific Gravity of cement: 3.15

(iii) Specific Gravity of FA & CA: 2.65, 2.7 respectively

(iv) Free surface moisture: Nil for CA & FA

(v) Fine aggregate: Confirming to grading zone I of table 4 of IS 383.

(vi) Chemical Admixture : Super Plasticizer.

Or

(b) (i) What are the methods for achieving high performance in concrete.

(ii) What properties of high strength concrete takes advantage in tall buildings?