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Question Paper Code: 39108

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2022

Elective

Civil Engineering

01UCE908 - CONCRETE TECHNOLOGY

(Regulation 2013)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. How can you distinguish alite and belite in a microscopic image?
2. What is Gap Graded Aggregate?
3. Discuss the advantages of using Pozzolanic material in ordinary Portland cement.
4. Distinguish between Plasticizers and Superplasticizers.
5. What is the difference between Design mix and Nominal mix?
6. What are the factors affecting choice of concrete mix design?
7. How does water cement ratio affect the strength of concrete?
8. What is Abram's law? Explain the factors affecting the compressive strength of concrete.
9. Define classification of light weight concrete.
10. Define aspect ratio.

PART - B (5 x 16 = 80 Marks)

11. (a) Explain the use and chemical composition of following cements: (i) Quick setting Cement (ii) Sulphate resisting Cement (iii) Low heat Cement (iv) Portland Pozzolana Cement. (16)

Or

(b) Enlist the different types of cement. Discuss about the properties and applications for any two types of cement in concrete construction. (16)

12. (a) Define Admixtures. Enlist the different types mineral admixtures used in concrete. Describe briefly the influence of three most important mineral admixtures on concrete. (16)

Or

(b) Explain the mechanism of action and advantages of following chemical admixtures in concrete: (i) Retarders (ii) Accelerators (iii) Water proofers. (16)

13. (a) Design a reinforced concrete mix M30 based on the provision of IS10262-2009 for the following data: (16)

Design stipulations for proportioning	Test data for materials
Grade designation : M30 Type of cement : OPC 43 grade Max. size of aggregate. : 20 mm Workability : 75 mm (slump) Exposure condition : Mild Degree of supervision: Good Type of aggregate. : Crushed angular Maximum cement content : 450 kg/m ³ . Chemical admixture : Not used	Specific gravity of cement : 3.15 Fine aggregate :Zone II Specific gravity of Coarse aggregate : 2.7 Fine aggregate : 2.6 Water absorption of Coarse aggregate =0.7% Fine aggregate = 0.5% Total moisture content of Coarse aggregate = 3% Fine aggregate = 2%

Or

(b) Compare the salient features of the BIS, ACI and DOE methods of concrete mix-design. (16)

14. (a) What are the different tests conducted in the lab to determine the workability of concrete? Compare the merit and demerit of each test. (16)

Or

(b) Explain the lab tests to determine the tensile strength of concrete and write comments on the tensile strength value obtained from these tests. (16)

15. (a) (i) Explain the following terms with respect to Fibre Reinforced Concrete:
(a) Volume fraction of fibres (b) Aspect ratio of fibres (c) Balling of fibres. (8)
- (ii) Explain shotcreting. Mention the advantages and disadvantages of dry and wet process in shotcreting. (8)

Or

- (b) What is Geo polymer concrete? Discuss the parameter involved in the producing of Geo polymer concrete. (16)

