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Question Paper Code: 31165

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2016

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. Differentiate between bleeding and segregation in concrete.
8. What is Abram's law? Explain the factors affecting the compressive strength of concrete.
9. What could be benefits of using high strength concrete from the owner's point of view?
10. Define classification of light weight concrete.

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) Explain the Lab tests to determine the following properties of fine aggregate:
 (i) Bulk Density (ii) Bulking (iii) Gradation of aggregate (iv) Specific gravity. (16)

12. (a) Explain the production method and advantages of adding following mineral admixtures in concrete: (i) Silica fume (ii) Ground granulated blast furnace slag (iii) Flyash (iv) Metakaoline. (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) Design M25 concrete based on the provisions of ACI 211.1-91 for the following data: (16)

Design stipulations for proportioning	Test data for materials
Grade designation : M25 Type of cement : OPC 43 grade Standard deviation: 4 MPa Max. nominal size of aggregate : 20 mm Maximum water cement ratio : 0.55 Workability : 80 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 Dry rodded density of coarse aggregate = 1600 kg/m ³ Fineness modulus of sand :2.80 Specific gravity of Coarse aggregate : 2.68 Fine aggregate : 2.55 Total moisture content Coarse aggregate : 6 % Fine aggregate :2 % Water absorption Coarse aggregate : 1% Fine aggregate : 0.5%

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 high performance concrete? Describe the tests to be performed to check the acceptability of any one high Performance concrete. (16)

