INSTITUTE OF AERONAUTICAL ENGINEERING
(Autonomous)

Four Year B.Tech V Semester End Examinations (Regular) - November, 2019

Regulation: IARE – R16

CONCRETE TECHNOLOGY

Time: 3 Hours | (CE) | Max Marks: 70

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

UNIT – I

1. (a) List various types of cement. Explain in detail the field test of cement. **[7M]**

   (b) Explain
   i) Ordinary Portland Cement
   ii) Rapid Hardening Cement
   iii) Sulphate Resisting Cement. **[7M]**

2. (a) What are super plasticizers? Classify it and explain the effects of superplasticizers on concrete. **[7M]**

   (b) Explain the following.
   i) Bulking of sand.
   ii) Fineness modulus of sand **[7M]**

UNIT – II

3. (a) Write any two tests to determine the workability of concrete in detail. **[7M]**

   (b) What are the effects of Time and Temperature in workability? Explain. **[7M]**

4. (a) Explain the slump cone test procedure for determining the workability of concrete. **[7M]**

   (b) Describe in detail about the importance of the quality of water used for concreting. **[7M]**

UNIT – III

5. (a) What is water-cement ratio of concrete? Mention its importance in detail. **[7M]**

   (b) What are factors affecting the ratio of tensile and compressive strengths. Explain. **[7M]**

6. (a) Describe the relation between creep and time. How does creep affect hardened concrete? **[7M]**

   (b) Define creep and explain various factors influencing creep. **[7M]**

UNIT – IV

7. (a) What are the factors affecting the choice of mix proportions? Explain. **[7M]**

   (b) Demonstrate the concept of mix design and mention the method of proportioning. **[7M]**

8. (a) Write in detail about requirements and factors to be considered for BIS method of mix design. **[7M]**

   (b) Design a concrete mix of M30 grade of roof slab. Take a standard deviation of 5 Mpa. The specific gravities of coarse aggregate and fine aggregate are 2.74 and 2.61 respectively. The bulk density of coarse aggregate is $1610 \text{ kg}/m^3$ and fineness modulus of fine aggregate is 2.72. A slump of 60 mm is necessary. The water absorption of coarse aggregate is 1% and free moisture in fine aggregate is 2%. Design the concrete mix using IS code method. Assume any missing data. **[7M]**

UNIT – V

9. (a) Explain the light weight concrete in detail with its properties. **[7M]**

   (b) What is polymer concrete? Explain its process of making, advantages and disadvantages. **[7M]**

10. (a) What is meant by high strength concrete? Explain the methods of making high strength concrete. **[7M]**

    (b) Write about engineering properties of geopolymer concrete. Mention its applications, merits and demerits. **[7M]**

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