

B.Tech III Year II Semester (R15) Regular Examinations May/June 2018  
**CONCRETE TECHNOLOGY**  
 (Civil Engineering)

Time: 3 hours

Max. Marks: 70

**PART – A**  
 (Compulsory Question)

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- 1 Answer the following: (10 X 02 = 20 Marks)
- What do you understand by initial setting time and final setting time of cement?
  - What are the factors governing the use of maximum size of aggregate in reinforced concrete?
  - Why is curing necessary?
  - What is bleeding and segregation in concrete?
  - What is meant by high performance concrete?
  - What is the principle of bacterial concrete?
  - What is creep?
  - Why is elastic moduli important for concrete?
  - Explain the significance of quality control of concrete.
  - Distinguish nominal and designed mixes?

**PART – B**  
 (Answer all five units, 5 X 10 = 50 Marks)

**UNIT – I**

- 2 (a) Describe 'bulking' of aggregates and method to determine it.  
 (b) What is the optimum dosage of super plasticizer? How do you determine the same?

OR

- 3 (a) Discuss in brief the alkali-aggregate reaction. What precautions are necessary to minimize?  
 (b) Describe the hydration reaction of important Bogue's compounds indicating the products of hydration.

**UNIT – II**

- 4 (a) Discuss various methods of curing concrete and their suitability.  
 (b) Explain the rheology of the concrete in terms of Bingham's parameter.

OR

- 5 (a) Determine the capillary porosity, total porosity and gel/space ratio for a cement paste with w/c ratio 0.5 and degree of hydration 90%.  
 (b) What are the various factors which affect the workability of concrete?

**UNIT – III**

- 6 (a) Explain the effect of volume, aspect ratio and orientation of fibres on fibre reinforced concrete.  
 (b) Discuss in brief the properties of high performance concrete in fresh and hardened state.

OR

- 7 (a) Explain the behavior of SFRC under compression, tension and flexure.  
 (b) What are the different aggregates that would be used in light weight aggregate? Mention the demerits of light weight aggregate.

**UNIT – IV**

- 8 (a) List the most important factors that affect drying shrinkage and creep.  
 (b) What are the principles behind the following test procedures: Schmidt hammer test, Windsor probe test, pullout test and ultra sonic pulse velocity test?

OR

- 9 (a) Why are shrinkage and creep treated together?  
 (b) Explain how to determine the static and dynamic modulus of elasticity of concrete.

**UNIT – V**

- 10 Design the concrete mix of M25 grade by BIS method with following data:  
 Specific gravities of cement, fine aggregate and coarse aggregates as 3.12, 2.90 and 2.60 respectively. Water absorption values for fine and coarse aggregates as 0.80 and 0.50 respectively. No Free moisture in both the aggregates. Slump to be 100 mm. Degree of quality control is good. Exposure condition is moderate. Determine the quantities of ingredients in kg/m<sup>3</sup> of concrete.

- 11 (a) Explain the factors affecting the mix design of concrete.  
 (b) Describe the procedure in adopting ACI method of concrete mix design.

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