

Roll No. 

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (CE) (Sem.-4) (2011 Batch)

**DESIGN OF CONCRETE STRUCTURES-I**

Subject Code : BTCE-403

Paper ID : [A1173]

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTION TO CANDIDATES :**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students has to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students has to attempt any TWO questions.

**SECTION-A****I. Write briefly :**

- a. What are the different processes of manufacture of cement?
- b. Discuss the rate of hydration of different cement compounds.
- c. Discuss the process of calculation of setting times of cement.
- d. Discuss Accelerating and Retarding Admixtures commonly used in concrete.
- e. Define Fineness Modulus and how is it calculated for aggregates (Fine and Coarse).
- f. Define "workability of concrete". Name the various tests done for the same.
- g. Discuss "Abrams Law".
- h. How is the Modulus of Elasticity of concrete evaluated?
- i. How is Durability of concrete taken into account in IS Code Method of Mix Design?
- j. How is the target mean strength of concrete calculated?

**SECTION-B**

2. Discuss, in detail the process of setting and hardening of concrete with stress strain diagrams.
4. Discuss the BIS method of Concrete Mix Design.
5. Design a rectangular beam for a simply supported span of 8 metres. Superimposed load on the beam is limited to 300mm by 600mm. Use M20 concrete and reinforcement as 50mm. Use M20 concrete.
6. A 250mm wide and 600mm deep RC beam is provided with 10mm inclined stirrups at 250mm c/c. The beam consists of 4 bars of 20mm diameter. The concrete grade is M25 and steel used is Fe 415. Design the section in shear.

**SECTION-C**

7. A T-beam floor consists of an RC slab and beams. Beams are spaced 3 metres apart. The slab is 150mm thick. If superimposed load on the intermediate beam. Use M20 and Fe 415.
8. Design the support section of a ring beam subjected to a bending moment of 150 kNm and a shear force of 200kN at ultimate.
9. Design a simply supported roof slab for a span of 8 metres. The superimposed load is 5kN/m<sup>2</sup>. Use M20 concrete and Fe 415.