Code: CE6T2

III B.Tech - II Semester – Regular Examinations – April 2016

DESIGN AND DRAWING OF CONCRETE STRUCTURES - II
(CIVIL ENGINEERING)

Duration: 3 hours   Max. Marks: 70

Answer any FIVE questions.   All questions carry equal marks

Use of **IS:456-2000** is permitted

1. A simply supported reinforced concrete beam of rectangular section 250mm x 450mm is used over an effective span of 4 meters. The beam is reinforced with 3 nos. 20 mm dia bars at an effective depth of 400 mm. Two hanger bars of 10 mm dia are provided. The self weight (dead load) on the beam is 4 kN/m and service live load is 10 kN/m. Compute
   a) Short term deflection
   b) Long term deflection
   Using M20 grade concrete and Fe415 grade steel.   14 M

2. Design a simply supported deep beam to the following requirements. Clear span is 4.20 meters, Bearing at each end is 450 mm, Over all depth is 3500 mm, width of beam is 250 mm, super imposed load is 225 kN/m. Use M20 grade concrete and Fe 415 Steel.   14 M

3. Design a flat slab without drop or column head. The slab is supported on columns spaced at 4.5 meters c/c in both directions. Live load may be taken as 4.5 kN/m². Column size is 400 mm X 400 mm and storey height is 5 meters. Columns may be taken as fixed at their foundation levels. Use M15 grade concrete mix and mild steel grade I.   14 M

4. Design combined rectangular footing for two columns A and B, Carrying loads of 300 kN and 700 kN respectively. Column A is 300 mm X 300 mm in size and column B is 400 mm X 400 mm in size. The centre to centre spacing of the columns is 3.4 meters. The safe bearing capacity of soil may be taken as 150 N/m². Use M20 grade of concrete and Fe 415 steel.

    14 M

5. Design the vertical stem of a reinforced concrete T-shaped retaining wall to retain 3 meters high earth with horizontal surface at the top. The unit weight of soil is 18 kN/m³ and angle of repose is 30^0. The safe bearing capacity of soil may be taken as 100 kN/m² and the coefficient of friction between soil and concrete as 0.5. Use M20 mix. and Fe 415 Steel bars.

    14 M

6. a) What is meant by serviceability and structural integrity of a structure and explain in detail about serviceability as per IS456?   7 M

b) What are the reasons for building failures?   7 M

7. What is meant by Ductility and explain its effecting factors?

                                                      14 M

8. Explain in detail the codal requirements for reinforced concrete buildings in the fire resistance.   14 M