6. An doubly reinforced beam section is 300 mm wide and 500 mm deep up to centre of tensile reinforcement. It is reinforced with 3-16ϕ as compression reinforcement at an effective cover of 50 mm and 4-20 ϕ tensile reinforcement. Calculate the ultimate moment of resistance of beam section for M25 and Fe415 steel. **15**

Unit IV

7. A simply supported beam 300 mm × 600 mm effective is reinforced with 5 bars of 25 mmϕ. It carries a UDL of 80 kN/m (including its own weight) over an effective span of 6 metres. Out of 5 main bars, two bars can be bent up safely near the supports. Design the shear reinforcement for the beam. Take M25 and Fe415. **15**

8. Design an reinforcement concrete square column of 500 mm side to carries an ultimate load of 2000 kN at an ecentricity of 140 mm about X-X axis. Use M20 and Fe415. **15**

E-73

B. Tech. EXAMINATION, Dec. 2018

(Fifth Semester)

(B. Scheme) (Main & Re-appear)

(CE)

CE305B

REINFORCED CONCRETE DESIGN-I

Time : 3 *Hours*]   [*Maximum Marks :* 75

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, taking at least *one* question from each Unit. All questions carry equal marks. Use of relevant IS code is allowed. Assume suitable data if not provided.

Unit I

1. (a) Explain in detail stress-strain diagram for steer and concrete. **5**

(b) Write different between : **10**
   (i) One-way and two-way slab
   (ii) Types of shear failures.

2. Design a slab over a room of 5 m × 7 m as per IS code. The slab is supported on massonary wall all round with adequate restraint and cornors are held down. The live load on slab is 3000 N/m^2. The slab has bearing of 300 mm on support wall. Take M20 and Fe415. **15**

Unit II

3. (a) Find the reinforcement required for a rectangular data : **10**
   (i) Size of section – 300 × 600 mm
   (ii) Bending moment - 100 kN-m
   (iii) Torsional moment - 50 kN-m.
   (iv) Shear force - 70 kN
   Take M20 and Fe415.

(b) Explain various Codal Provision for bond and development length at support for compression and tension steel. **5**

4. (a) Design a column between floors with both end fixed. The center to center distance between floor is 4 metres. Design the column for a axial load of 1400 kN. Take M25 and Fe415. **7**

(b) A circular R.C.C. column of 500 mm diameter is provided with 12 bars of 20 mm ϕ. The column is subjected to an axial load of 800 kN and a bending moment of 35 kN-m. Find whether the design is safe or not. **8**

Unit III

5. (a) Estate and explain various assumption for limit state method of design. **5**

(b) Write difference between limit state and working stress method of design. **5**

(c) Explain the significance of $\chi_{ulim/d}$. **5**