Total No. of Questions : 8] *[Total No. of Printed Pages : 2*

Roll No .....

CE-6002 (CBGS)

B.E. VI Semester

Examination, November 2019

Choice Based Grading System (CBGS)

Structural Design - I (RCC)

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions.
ii) All questions carry equal marks.
iii) Assume suitable data.

1. a) Explain the methods of R.C.C. Design. 7
   b) Find the moment of resistance of a R.C.C. beam 300 mm wide and 500 mm effective depth is reinforced with 4 bars of 12 mm. M20 concrete and Fe 415 is used. 7

2. Design a rectangular beam 230mm × 600mm over an effective span of 5 m. The super imposed load on the beam in 50 kN/m effective cover to reinforcement is taken as 50 mm. Use M20 concrete and Fe 415 steel. 14

3. Design a reinforced concrete slab for a room of clear dimensions 4m × 5m. The slab is supported on walls of width 300 mm. The slab is carrying a live load of 4 kN/m^2 and floor finish 1 kN/m^2. Use M20 concrete and Fe 415 steel. The corners of slab are held down. 14

4. a) Explain the classification of columns. 7
   b) A reinforced concrete short column is 400mm × 400mm and has 4 bars of 20 mm diameter. Determine the ultimate load carrying capacity of column if M20 concrete and Fe415 steel is used. Assume $e_{min} < 0.05D$. 7

5. a) Describe the various types of staircase according to their geometrical classification. 7
   b) Write short notes on: 7
      i) Flight ii) Landing
      iii) Rise iv) Tread

6. a) Find the moment of resistance of a T-beam having a web width of 240 mm effective depth of 400 mm. Flange width of 740mm and flange thickness equal to 100mm. The beam is reinforced with 5-16 mm diameter. Use M20 mix and Fe 415 bars. 7
   b) An R.C.C. beam 400mm × 600mm effective is reinforced with 4 bars of 25 mm diameter. The beam is subjected to a bending moment of 150 kN-m. Find the stresses set up in steel and concrete. 7

   a) Explain the difference between one way slab and two way slab. 7
   b) Give IS specification regarding reinforcement in a column. 7

   Design a rectangular footing of uniform thickness for an axially loaded column of size 300mm × 600mm load on column is 1150 kN. SBC of soil is 200 kN/m^2. Use M20 mix and Fe 415 bars. 14

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