Total No. of Questions :5] *[Total No. of Printed Pages :2*

Roll No .....

CE - 504

B.E. V Semester

Examination, December 2012

Structural Design and Drawing-I (RCC)

Time : Three Hours

Maximum Marks : 70/100

Note : *1. Attempt any five questions. All questions carry equal marks.*
2. Use of IS: 456-2000 is permitted.
3. Draw reinforcement details wherever required.
4. Missing data if any, may be suitably assumed.

1. a) Discuss various assumptions of limit state design method.
   b) Discuss balanced section with regard to working stress design method.

OR

   a) Discuss different assumptions of working stress design method.
   b) Discuss balanced section with regards to Limit State Design method.

2. Find the moment of resistance of a beam 25cm by 50cm deep if it is reinforced with 2-12mm bars in compression zone and 4-20mm bars in tension zone, each at an effective cover of 40mm. Assume (i) M15 mix and Fe250 grade steel, (ii) M15 mix and Fe 415 grade steel.

OR

Determine the ultimate moment capacity of the following T beam: Effective flange width = 900mm. Depth of flange = 140mm, web width = 300mm, effective depth = 420mm, area of tension steel = 1570mm^2. Assume Fe 415 steel and M 25 grade concrete.

3. Design a simply supported slab for a room 7.5m x 3.0m clear in size if the live load is 4 kN/m^2. The slab is supported on 230mm thick walls.

OR

Design a simply supported slab for a room 5.0m x 4.0m clear in size if the live load is 2 kN/m^2 and corners held down.

4. Design a rectangular column section subjected to an axial load of 1200 kN and uniaxial moment of 40 kNm.

OR

Design isolated footing for the column subjected to an axial load of 1500kN. Take safe bearing capacity of soil as 120 kN/m^2.

5. Design a dog-legged staircase to be provided in a residential multistoreyed building. Clear space available is 2.4m x 4.8m. Height of each flight is 1.5m and floor to floor height is 3.0m. Length of landing on either side along the direction of flight is 1.0m. Take live load as 3.0 kN/m^2.

OR

Design the waist slab type staircase comprising a straight flight of steps, supported between two stringer beams along the two sides. Given: riser = 160mm; tread = 280mm; width of staircase = 2.0m; width of beams = 250mm. Assume a live load of 3.0 kN/m^2 and moderate exposure condition.

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