Registration No. : | | | | | | | | | | |

Total number of printed pages – 2

B. Tech

PCCI 4301

Fifth Semester Examination – 2013

DESIGN OF CONCRETE STRUCTURES

BRANCH : CIVIL

QUESTION CODE : C-344

Full Marks – 70

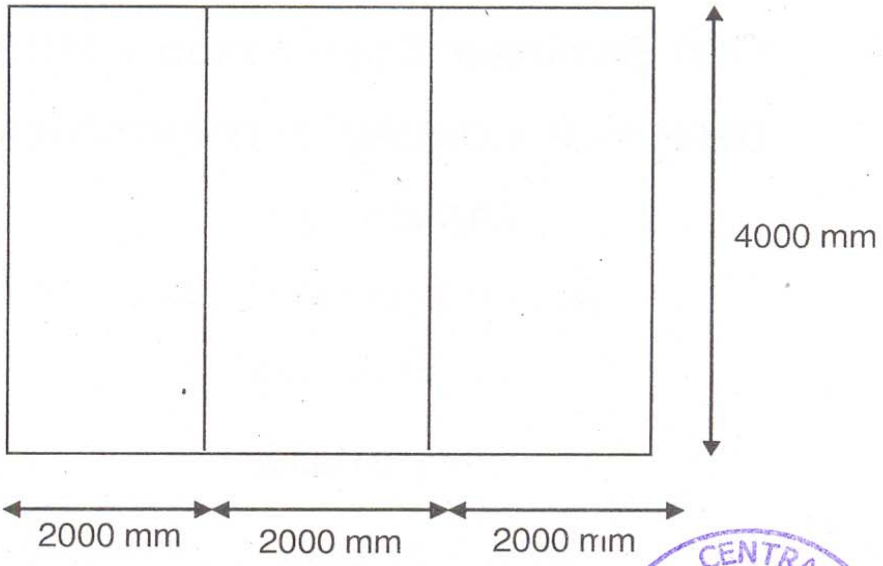
Time : 3 Hours

*Answer Question No. **1** which is compulsory and any **five** from the rest.*
The figures in the right-hand margin indicate marks.
Use of IS 456 : 2000 is allowed for reference.

1. Answer the following questions : 2×10
   (a) Define characteristic strength and characteristic load.
   (b) What is the purpose of provision of shear reinforcement ?
   (c) What for cover to reinforcement is provided ? Specify the minimum cover required for bars in a column, in a beam and in a slab.
   (d) Differentiate between nominal mix and design mix.
   (e) Define development length.
   (f) Define slenderness ratio. What is its importance ?
   (g) Differentiate between one-way and two-way slab.
   (h) What are the minimum and maximum amounts of longitudinal reinforcement permissible in a column ?
   (i) How would you determine the minimum depth of foundation ?
   (j) Draw a typical flight and show tread, riser, waist and going.
2. Determine the ultimate moment capacity of a doubly reinforced beam of b = 350 mm, d' = 60 mm, d = 600 mm, Ast used is 6-25T and Asc used is 4-20T. Use M20 and Fe 415. 10

P.T.O.

3. Design the one-way continuous slab as shown in the figure below, which is subjected to uniformly distributed imposed load of 4 kN/m^2 using M 20 and Fe 415. The load of floor finish is 2 kN/m^2 .The span dimensions shown are effective spans. The width of beams at the support is 300 mm. 10



4. Determine the shear reinforcement of the simply supported beam of effective span of 8m.Width of beam is 300 mm, depth of beam is 550 mm. The reinforcement used are 2-25T + 2-20T at the bottom and 2-12T at the top. Factored shear force is 250 kN. Use M20 and Fe 415. 10

5. Design the stairs for a public building supported on wall on one side and stringer beam on the other side.The horizontal span of stairs is 1.4m. The risers are 120 mm and tread are 300 mm. Use M20 and Fe 415 steel. 10

6. Design a circular column of 700 mm diameter with helical reinforcement subjected to an axial load of 5000 kN. Use M25 and Fe 415. 10

7. Design an isolated footing for a square column of size 400 mm × 400 mm with 12-20 mm diameter longitudinal bars carrying service loads of 1500 kN with M20 and Fe 415. The safe bearing capacity of soil is 230 kN/m^2 and at a depth of 1 m below the ground level. 10

8. Differentiate between (any **two**) : 5×2
   (a) Under reinforced and over reinforced sections
   (b) Limit state and working stress method
   (c) One-way shear and two-way shear.