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

Roll No .....

CE-504

B.E. V Semester

Examination, December 2016

Structural Design and Drawing-I (RCC)

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions.
ii) Each question is of 14 marks.
iii) Missing data may be suitable assumed.

1. a) Mention properties of cement concrete and reinforcing steel. 4
   b) Differentiate between Limit state and working stress method of designs. 10

2. a) Explain the mechanism of load transfer for structural design of an RCC framed building. 4
   b) For a span of 5.0m and a superimposed load of 60 kN/m at service state using M-20 grade of concrete and Fe-415 steel; design : 2×5=10
      i) A simply supported beam
      ii) A cantilever beam
      Sketch the reinforcement details.

3. a) Differentiate between : 2×2=4
      i) Simply supported and continuous slab.
      ii) Slab spanning in one direction and slab spanning in two directions.

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   b) For a clear span of 3.60m, design a simply supported slab spanning in one direction and supported and 200mm thick brick walls. Live load on the slab is 4kN/m^2. Use Fe-415 steel and M-20 concrete. Sketch the reinforcement details. 10

4. For a room of size 3.0×4.50m, design a two way slab. Consider the slab simply supported with discontinuous edges on all the four sides and corners prevented from lifting take a service live load on the slab as 4 kN/m^2. Adopt Fe-415 grade of steel and M-20 concrete. Sketch the reinforcement details. 14

5. a) Differentiate between isolated and strap footing. 4
   b) For an ultimate axial load of 2000 kN, design a column with : 10
      i) Circular section
      ii) Square section

6. Design an isolated R.C.C. footing for a square column of section 400×400mm supporting an axial factored load of 2000kN. The safe bearing capacity of the soil at site is 180 kN/m^2. Use M-20 concrete and Fe-415 steel. Sketch the reinforcement details. 14

7. Design the waist slab of a flight of dog-legged staircase spanning between plinth beam and landing beam. There are 10 steps in the flight with Riser and Tread of 150mm and 300mm size respectively width of plinth and landing beams may be taken as 200mm. Take live load as 4.0kN/m^2. Use M-20 concrete and Fe-415 steel reinforcement. Sketch the reinforcement details. 14

8. Write short notes on any two : 2×7=14
   a) Yield line theory of design
   b) Slabless Tread-Riser staircase
   c) Column subjected to axial loads and Bending moments
   d) Design of beams for Shear and Bond

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