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Question Paper Code: 35011

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2017

Fifth Semester

Civil Engineering

01UCE501 – DESIGN ON REINFORCED CEMENT CONCRETE AND MASONRY STRUCTURES

(Regulation 2013)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions

(Use of M20, Fe415, IS 456:200 and SP 16 design Aids are permitted, assume data for any other)

PART A - (10 x 2 = 20 Marks)

1. Write the formula for the neutral axis depth factor in working stress design.

2. What are the advantages of elastic method of design.

3. Define the modes of cracking under shear.

4. Differentiate the singly and doubly reinforced beam.

5. Write the few types of staircases.

6. Write any two various boundary conditions in the two way slab acting UDL.

7. Write any two situations in which combined footings are preferred to isolated footing.

8. Under what circumstances combined footing is necessary.

9. What is the purpose of providing a lateral support in a masonry structure?

10. Define slenderness ration of a masonry wall.

PART - B (5 x 16 = 80 Marks)

11. (a) (i) Explain the advantages of limit state method over other methods.   (10)

    (ii) List the assumptions of working stress method.   (6)

Or

(b) Explain briefly about the concept of ultimate load method and limit state method.

(16)

12. (a) Discuss briefly about the design requirement for bond and anchorage in RC beam design as per IS code and also write note briefly on serviceability requirements. (16)

Or

(b) Design a *T*-beam for an office floor using following data: Effective span = 8*m*, spacing between *T* beams = 3*m*, live load and floor finish are *4kN/m²* and 0.6 *kN/m²* respectively and also slab thickness = 150*mm*. Draw a reinforcement details. (16)

13. (a) Design and draw a suitable doglegged stair for a public building in which the vertical distance between floors is 3.6*m*. The stair hall measures 5 *m* x 2.5 *m*. The live load on the stair is 4 *kN/m²*. (16)

Or

(b) Design a dog legged stair for a building in which the vertical distance between the floors is 3.6 *m*. the stair hall inner dimensions are 2.4 *m* x 5 *m*. The live load on the stair is 3000 *N/m²*. Adopt M-20 grade concrete and Fe-415 grade steel. (16)

14. (a) Design a combined footing with strap beam for two reinforced concrete column of size 300 *mm* x 300 *mm* spaced 4 *m* centre to centre, and each supporting a service axial load of 500 *kN*. The safe bearing capacity of soil at site is 150 *kN/m²*. Draw reinforcement detailing for the footing. (16)

Or

(b) Design and draw the reinforcement in a short column 400 *mm* x 600 *mm* subjected to an ultimate axial load of 1600 *kN* with ultimate moment of 120 *kNm* and 90 *kNm* about major and minor axis respectively. (16)

15. (a) Design an interior cross wall to two storied building to carry 100 *mm* thick RCC slab with 3.0 *m* ceiling height. The wall is un-stiffened and its supports a 2.65 *m* wide slab. The live load on roof – 1.50 *kN/m²*, live load on floor – 2.0 *kN/m²*, weight of 80 *mm* thick terrace – 1.96 *kN/m²*. Weight on floor finish - 0.20 *kN/m²*. (16)

Or

(b) Design a solid square masonry column of height 2000 *mm* to carry an axial load of 150 *kN*. The column is tied at top and bottom. Include the self-weight of the column for the design. (16)

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