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**Reg. No. :**

**Question Paper Code: 45011**

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

Fifth Semester

Civil Engineering

14UCE501 - DESIGN OF REINFORCED CEMENT CONCRETE AND MASONRY STRUCTURES

(Regulation 2014)

(Use of IS456-2000, IS 1905-1987 and SP16-1980 are permitted)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Analysis of reinforced concrete can be done by

(a) straight line theory (b) elastic theory (c) ultimate load theory (d) all the above

2. In working stress method, the modular ratio ‘m’ for M20 grade of concrete is

(a) 11 (b) 9.33 (c) 13.33 (d) 18.67

3. The design bond stress of plain bars in tension in M30 grade of concrete is

(a) 1.5 (b) 1.2 (c) 1.0 (d) 1.4

4. Shear reinforcement is provided in the form of

(a) vertical bars (b) inclined bars (c) combination of vertical and inclined bars (d) any one of these

5. The analysis of slab spanning in one direction is done by assuming it to be a beam of

(a) lm length (b) l m width (c) 1 m2 area (d) none of these

6. The analysis of slab spanning in one direction is done by assuming it to be a beam of

(a) l*m* length (b) l *m* width (c) 1 *m2* area (d) none of these

7. When the ratio of effective length of the column to its least lateral dimension does notexceed12, it is termed as a

(a) long column (b) short column (c) plain column (d) none of these

8. The slenderness ratio of a RCC long column is greater than

(a) 20 (b) 15 (c) 12 (d)16

9. The properties used for pseudorandom sequence are

(a) Balance (b) Run (c) Correlation (d) All the above

10. The Name of the code used for the design of masonry structures is

(a) IS 456 (b) SP 16 (c) IS 1905 (d) IS 800

PART - B (5 x 2 = 10 Marks)

11. What is the concept of limit state of design?

12. Define under reinforced section?

13. Distinguish between one way slab and two way slab.

14. Sketch the critical section one way shear in footing.

15. Define slenderness ratio of masonry wall.

PART - C (5 x 16 = 80 Marks)

16. (a) Explain the procedure for design for limit states.. (16)

Or

(b) Discuss about the limit state method as detailed in current IS code. Also state the advantages of limit state method over other methods. (16)

17. (a) Design the flexural reinforcement for a beam by with size 250mm x 400mm and that

it has to carry in addition to the loads an udl of 10kN/m and a dead load of 5kN/m

and point load of 30kN placed at its midspan. Use M25 and Fe415. Take effective

span =6m***.*** (16)

Or

(b) Find the moment of resistance of a singly reinforced concrete beam of 200 *mm*  wide and 400 *mm* effective depth, reinforced with 3 bars of 16 *mm* dia. of Fe 415 steel. Take M20 concrete. (16)

18. (a) Design the interior span of a continuos one way slab for an office floor continuos

over T beams spaced at 4 m centres. Assume fck=25 N/mm2 and Fe415 steel. (16)

Or

(b) Design a R.C slab 6.3 *m* x4.5 *m* simply supported on all the four sides.It carries a live load of 10 kN/m2 in addition to dead load.Use M20 Concrete and Fe415 steel.

(16)

19. (a) Design a suitable footing for the column of size 300 *mm* x 500 *mm* supporting a service load of 1000 *kN*. Assume SBC of soil as 200 *kN/m2*. Use M20 concrete and Fe415 steel. (16)

Or

(b) A reinforced concrete column 400mmx400mm supports an axial service load of 1000kN. The safe bearing capacity of the soil is 200kN/m2. Adopting M-20 grade concrete and Fe-415 HYSD bars design a suitable footing for the column and sketch the details of reinforcements. (16)

20. (a) Design an interior wall of a two storeyed building to carry 125mm thick RCC slabs

with 3.1m ceiling height. The wall is unstiffened and supports a 2.65m wide slab.

Live load on the roof = 2kN/m2

Live load on the floor = 2 kN/m2

Weight of 80mm thick terrace = 2 kN/m2

Weight of floor finish = 2 kN/m2. (16)

Or

(b) What are the factors to be considered while designing the brick masonry with respect to stability and lateral supports on the structure? Explain them in detail.

(16)