Roll No. 3357728

24378

B. Tech. 6th Semester (Civil Engg.) Examination – May, 2014

DESIGN OF CONCRETE STRUCTURES-II

Paper : CE-302-F

Time : Three Hours] *[M.M. : 100*

Before answering the question, candidates should ensure that they have been supplied the correct and complete question paper. No complain in this regard, will be entertained after examination.

Note : Attempt *five* questions in all. Question No. 1 is ***compulsory*** and solve *one* question from each Section. Use of I.S. Code 456-2000, 3370 Vol. I to Vol. IV are permitted. Draw neat diagrams and drawings with designs. All questions carry equal marks. Assume suitable data if missing and where so ever necessary.

1. State whether the following statements are *true* or *false* :

(a) The symmetrically placed columns induce torsion at the centre of curved beam as maximum.

(b) The torsional moment at the support of continuous beam will be maximum.

(c) The drop if provided for flat slabs, will have a length in each direction not less than 1/3rd of the Panel length in that direction.

(d) The walls of tank resting on ground are subjected to weight of water and pressure of soils.

(e) Concrete mix weaker than M20 can be used in the construction of elevated water tank.

(f) Water retaining structures are not designed as per IS 3370-2000.

(g) Building frame does not consist of beam and column constructed monolithically.

(h) Yield line theory is based on Shear forces and Bending Moment which lead to collapse of structure. 8 x 2.5 = 20

SECTION – A

2. (a) How will you calculate the Shear force, Bending Moment and Torsional Moments at a point 'P' at an angle ϕ from one support of curved beam ?

(b) What are the basic assumptions made in the design of continuous beams. 12 + 8 = 20

3. A flat slab with drops is proposed for a warehouse building 20 m x 30 m size. Using column grid of 5m x 5m ; design an interior panel of flat slab to support a live load of 7.5 kN/m^2. Adopt M20 grade concrete and Fe 415 grade steel. 20

OR

Design a suitable staircase for multistoreyed building, having staircase hall 2.5 m x 4.5 m. The height between floors is 3.5 m. Live load for design be taken as 3000 N/m² and finishes 750 N/m². Use M20 concrete and Fe250 grade steel. 20

SECTION – B

4. (a) What are the causes of failure of foundations ?

(b) State assumptions in the design of foundations.

(c) Design a combined footing (trapezoidal) for two columns 450 mm x 450 mm and 600 mm x 600 mm carrying 800 kN and 1000 kN load respectively. The columns are located 4.0 m apart. The safe Bearing Capacity of the soil is 200 kN/m². Use M20 concrete and Fe 415 grade steel. The maximum Projection allowed is 500mm beyond face of each column. 3 + 3 + 14 = 20

5. (a) Design a circular tank for a capacity of 500 kilo-litres with flexible joints at base. Use M25 concrete and Fe415 grade steel.

(b) What do you understand by minimum cover of reinforcement. 16 + 4 = 20

SECTION – C

6. (a) Define Pre-stressed concrete. How does it differ from other types of concretes ?

(b) What are the characteristics of Prestressed concrete ? State its advantages and uses.

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(c) Give a comparison (in tabulated form) of Pretensioning and Post tensioning systems of P.S.C. 4 + 10 + 6 = 20

7. (a) What do you understand by substitute frame ?

(b) Write short notes on Testing of Beam and column sections.

(c) Design sheeting and Yokes for a column 300 mm × 300 mm for 3 m in height upto bottom of beam. 4 + 6 + 10 = 20

SECTION – D

8. An triangular slab ABC is simply supported along AB = 8 m; BC = 6 m and is free along edge CA. The horizontal and vertical reinforcements at the bottom of the slab provide ultimate moment capacities of 100 kN.m/m each. Assume $\theta = 60°$.

Determine the yield line pattern and uniformly distributed collapse load. 20

9. (a) Find the ultimate load for square slab continuous on all four edges.

(b) Define Isotropically and Orthotropically reinforced slabs. 16 + 4 = 20