

(DCE 324)

B.Tech DEGREE EXAMINATION, MAY - 2015

(Examination at the end of Third Year)

CIVIL ENGINEERING

Paper - IV : Design of Concrete Structures - II

Time : 3 Hours

Maximum Marks : 75

Answer ONE question from each unit

(5 × 15 = 75)

UNIT - I

- 1) Design a continuous reinforced concrete beam of rectangular section to support a dead load of 10 kN/m and live load of 10 kN/m over 3 spans of 6m each. The ends of the beam are simply supported. Use M20 grade concrete and Fe415 grade steel materials. [15]

OR

- 2) Design a short R.C. column to take an axial load of 5000 kN. The size of the column is not to be more than 700 mm. Use spiral reinforcement adopt M25 grade of concrete and Fe415 grade steel. [15]

UNIT - II

- 3) Design a two way slab for a residential roof to suit the following data: size of the roof is 4.5m×6.0m. Edge conditions are simply supported on all the sides on load bearing masonry walls 300 mm thick without any provision for torsion at corners. Use M20 grade of concrete and Fe415 grade of steel. [15]

OR

- 4) Design an interior panel of a flat slab 5m×6m. The slab is supported on columns 500 mm in diameter. The floor of the slab is likely to be used for the conference hall use M20 grade of concrete and Fe415 grade of steel. [15]

UNIT - III

- 5) Design the longitudinal and lateral reinforcement in a rectangular reinforced concrete column of size 300 mm × 400 mm when subjected to a design ultimate load of 1200kN and an ultimate moment of 150 kNm with respect to the major axis use M20 grade of concrete and Fe415 grade HYSD bars. [15]

OR

- 6) A R.C. column of unsupported length of 3.0m is to be designed for a factored axial load of 2500 kN. Determine the cross sectional dimensions of the column and reinforcement required. [15]

UNIT - IV

- 7) Determine suitable dimensions of a cantilever retaining wall which is required to support an earth 4.5m above ground level on the toe side of the wall. The back fill is inclined at 20° to the horizontal. The safe bearing capacity of soil may be taken as 150 kN/m^2 at a depth of 1.3m below ground level. The unit weight of backfill earth is 16 kN/m^3 and angle of shearing resistance is 30° . The coefficient of friction between soil and concrete is 0.5. [15]

OR

- 8) a) What are the various types of retaining walls. Explain the cantilever type R.C.C retaining wall with neat sketches.
- b) List the various forces and stability requirements to be considered in the design of retaining walls.

UNIT - V

- 9) Design a square footing for a column $300 \text{ mm} \times 500 \text{ mm}$ carrying a load of 1350 kN. Assume soil with an allowable pressure of 200 kN/m^2 at a depth of 1.5m below the ground level. Use M20 grade of concrete and Fe 415 grade of steel. [15]

OR

- 10) A column carrying a load of 2500 kN has to be supported by four piles, each of size $300 \text{ mm} \times 300 \text{ mm}$. The piles are spaced at 1m centre. The column size is $600 \text{ mm} \times 600 \text{ mm}$. Design the pile cap. Use M20 grade concrete and Fe 415 steel. [15]

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