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Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(CE) (2011 Onwards) (Sem.-6)
DESIGN OF CONCRETE STRUCTURES-II
Subject Code : BTCE-601
Paper ID : [A2288]

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. **SECTION-A** is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. **SECTION-B** contains **FIVE** questions carrying **FIVE** marks each and students has to attempt any **FOUR** questions.
3. **SECTION-C** contains **THREE** questions carrying **TEN** marks each and students has to attempt any **TWO** questions.

SECTION-A

1. Write briefly :

- a) What is tread and riser? Explain with neat diagram.
- b) Define Slenderness ratio
- c) List the types of stair.
- d) In the case of curved beams, the support sections are designed for maximum negative bending moment and shear. Give your comments
- e) List the loads you will account for design of Domes.
- f) What are compression members?
- g) Describe at least two functions of a shear key.
- h) How can you reduce crack width in R.C. members subjected to tension?
- i) Show plan and elevation of counter-fort retaining wall.
- j) List the types of footing used in residential buildings.

SECTION-B

2. Design a two flight staircase with stepson waist slab for floor to floor height of 3.5 mtr. Width of flight equal to 1.60 m. and superimposed load of 4.5 KN/m^2 for simply supported at the end of landing slabs which span in the direction of flight.
3. Design a pad footing (constant depth) for a rectangular column $350 \text{ mm} \times 500 \text{ mm}$ carrying an axial compressive load of 1800 KN. The safe bearing capacity of soil is 150 kN/m. Use M20 concrete and Fe415 steel.
4. Design a column of rectangular section subjected to an axial load of 600 kN and uniaxial moment of 275 kN/m. Consider concrete of grade M25 and steel of grade Fe415.
5. Design a Spherical roof for a hall having a diameter 15 m. The rise of dome is 1.5 m. Assume $LL = 4000 \text{ N/m}^2$. Take allowable stress in tension in concrete = 2 MPa and compression in concrete = 5 MPa. Stress in steel both in tension & compression = 100 MPa.
6. Explain the design principles of counter-fort retaining wall.

SECTION-C

7. How the beams curved in plan differs from other beams? Derive the equations for Bending Moment, Twisting Moment and Shear Force for a beam circular in plan and supported on columns. Take suitable number of columns.
8. A continuous beam ABCDE has four equal spans of 7m each. It rests over masonry wall, and carries a superimposed load DL of 12 kN/m and LL of 7 kN/m. Design an interior end span of the beam sketch the reinforcement. Use M20 concrete and Fe500 steel.
9. Design a rectangular water tank of size $6\text{m} \times 4\text{m} \times 3\text{m}$ (depth) resting on leveled ground. Use M25 and Fe415. The bottom of side walls are fixed to the base and top hinged.