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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

INSTRUCTIONS 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) When a shear key is provided in a reinforced concrete retaining wall?

   b) What is the shape of pressure distribution diagram beneath the footing when the footing is the symmetrically loaded?

   c) What is pitch of lateral ties in an axially loaded column?

   d) In which cases 8-legged stirrups are provided in a combined footing?

   e) What are the various cases of failures of combined footing?

   f) In which conditions strap footing are provided?

   g) What are the various forces which are considered r for designing domes?

   h) What is the shape of shear stress diagram in a reinforced concrete beam section?

   i) What is minimum cover provided in a trapezoidal footing?

   j) What is the maximum spacing of vertical stirrups in rectangular beams?

SECTION B

2. Design the stair for public building supported on wall on one side and stringer beam on other side. The horizontal span of stairs is 1.4 m. The risers are 120 mm and tread are 300 mm. Use M 20 mix and Fe 415 steel.

3. A R.C. Column 400 mm × 400 mm in section carries an axial load of 750 kN. Design sloping R.C footing for the column using M 20 concrete and Fe 415 steel. Take safe bearing capacity of soil = 120 kN/mm^2.

4. Explain the method of designing a shear key for a retaining wall.

5. What are the various structural elements of Intz type tank and what are their design principles?

6. Explain the methods of designing vertical stem, toe slab and heel slab of a T-shaped cantilever retaining wall. What will be the changes in the design if counterforts are provided at rectangular interval towards t he side of backfill?

SECTION C

7. A continuous beam with simple supports has two spans each of 8 m. The characteristic dead load is 10 kN/m. and characteristic live load is 15 kN/m. Design the critical sections of the beam. Use M 20 concrete and Fe 415 tor steel.

8. A circular girder of a water tank has a mean diameter of 10 m, and it is supported on six symmetrical placed columns. The uniformly distributed load on the girder is 20 kN/m. Design the critical sections of the girder using M 20 grade concrete and Fe 415 grade Tor Steel, and sketch the details of reinforcements.

9. Design a spherical dome over a circular room of 20 m diameter. The rise of the dome may be taken equal to 1/5 of the diameter. The dome carries a lantern load of 30 kN attached at the circumference of an opening of 2 m diameter at the apex. Take live load due to wind etc. as 1.5 kN/m^2 of the surface area of the dome. Use M 20 Concrete and Fe 415 steel.