

Roll No.

Total No. of Pages : 2

Total No. of Questions : 09

B.Tech.(CE) (Sem.-6)

**DESIGN OF CONCRETE STRUCTURES-II**

Subject Code : CE-310

Paper ID : [A0622]

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 are Dome Structures and discuss the types of stresses in these structures.
- b. Under what circumstances are isolated footings preferred?
- c. What are the different types of stresses encountered in circular or ring beams?
- d. What are the critical stress conditions for which an underground water tank is designed?
- e. When are trapezoidal footings preferred in RC constructions?
- f. What is a Raft Footing?
- g. Discuss the common types of retaining walls provided in RC constructions.
- h. What are the various stability checks applied in retaining walls?
- i. Discuss the minimum reinforcement requirements in walls of water tanks.
- j. Draw and discuss the various components of an Intze Tank.

**SECTION-B**

2. Design a spherical dome for hall 8 metres in diameter. Rise of dome is 1.6 meters. Live load and finish load on the dome is  $0.75 \text{ kN/m}^2$  and  $0.25 \text{ kN/m}^2$  respectively. Use M20 and Fe250 steel.
3. Design a circular ring beam of a water tank of dimensions 300mm by 600mm supported on eight equally spaced columns. The centres of columns are on a circular curve of diameter 8m. The service load intensity on the beam is  $100 \text{ kN/m}$  and the diameter of columns is also 300mm  
Use M20 concrete and Fe415 steel.
4. Determine the area and depth of foundation of a square column carrying 1000kN vertical load. The gross bearing capacity of the soil is  $100 \text{ kN/m}^2$ , density is  $17 \text{ kN/m}^3$  and the angle of repose is  $29^\circ$ . Use M20 concrete and Fe415 steel.
5. Discuss the design features of OHSR (Overhead Service Reservoirs).
6. Discuss the design features of Counterfort Retaining Walls.

**SECTION-C**

7. Design a rectangular combined footing for two columns 450mm x 450mm and 600mm x 600mm carrying 800 kN and 1000 kN respectively. The columns are located 4.0 m apart. The safe bearing capacity of the soil is  $200 \text{ kN/m}^2$ . Use M15 concrete & Fe 250 steel.
8. Design a cantilever retaining wall to retain a level earthfill of 5 m above ground level. The surcharge on the earth fill is  $18 \text{ kN/m}^2$ . The angle of repose of soil is  $30^\circ$ , unit weight of the soil is  $16 \text{ kN/m}^3$ , coefficient of friction between soil and concrete is 0.6 and the safe bearing capacity of soil is  $200 \text{ kN/m}^2$ . Use M20 concrete and Fe250 steel.
9. Design a rectangular tank resting on the ground for a capacity 100 Kilolitres. Use M20 concrete and Fe250 steel.

[N-2-1637]