

Roll No. 

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(CE) (Sem.-6<sup>th</sup>)**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****I. Write briefly :**

- a. Explain the type of stresses in symmetrical dome structures.
- b. Give two examples of curved beams and discuss the type of stress resultants encountered in these beams.
- c. Discuss 'Strap Footing' and under what conditions it is provided.
- d. How is the reinforcement provided in cylindrical beams resting on edge beams? Show diagrammatically.
- e. Outline the analysis and design conditions of an underground water tank.
- f. Discuss some of the common causes of failures in foundations.
- g. Explain the stability criteria of a retaining wall.
- h. Explain the analysis and design criteria of a counterfort in a retaining wall.
- i. Discuss minimum reinforcement criteria in floors and walls of water tanks.
- j. Discuss the main components of an Intze Tank.

**SECTION-B**

2. Design a semicircular beam support. The centres of columns are on a circular beam. The superimposed load on beam is 25 kN/m. Use M20 concrete and steel. Show the design details.
3. Describe the design criteria for a retaining wall.
4. Design a square spread footing to carry a 40 cm square tied column containing 4 bars. The bearing capacity of the soil is 20 kN/m<sup>2</sup>. Use M20 concrete and steel. The depth of footing 1 meter below the ground level is 1.5 m.
5. Design a spherical dome for hall 10 m diameter and 2 meters height. Live load and finish load are 0.25 kN/m<sup>2</sup> respectively. Use M20 concrete and steel.
6. Discuss in detail, the design and construction of roofs, walls and joints of water tanks.

**SECTION-C**

7. Design a rectangular combined footing to carry two columns of size 400 mm x 600 mm carrying 1000 kN each. The columns are located 4.0 m apart. The soil bearing capacity is 150 kN/m<sup>2</sup>. Use M20 concrete & Fe 25.
8. Design a cantilever retaining wall to retain a soil of height 4 m above ground level. The surcharge on the top of soil is 20 kN/m<sup>2</sup>. The repose of soil is 30°, unit weight of soil is 20 kN/m<sup>3</sup>. The friction between soil and concrete is 0.4. Use M20 concrete and steel.
9. Design a circular tank for a capacity of 1000 m<sup>3</sup> of water. The tank has a flexible base i.e. walls and base slab are rigidly connected. Use depth of tank as 4 meters. Use M20 concrete and steel.