Dec.-22-0233

CE-601 (Design of Concrete Structures-II)

B.Tech. 6th (CBCS)

Time : 3 Hours   **Max. Marks : 60**

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt Five questions in all, selecting one question from each Sections A, B, C and D. Section E is compulsory. Relevant codes are allowed. Assume any missing data.

SECTION - A

1. Explain in detail the following types of foundations and discuss the conditions under which the following foundations are used:

   (a) Eccentrically loaded footings

   (b) Raft or mat footing

   (c) Pile foundations   (10)

2. Design the footing for a reinforced concrete column 225 mm × 450 mm carrying an axial load of 1075 kN. The bearing capacity of the soil is 100kN/m^2. Use M15 concrete and mild steel as reinforcement.   (10)

SECTION - B

3 (a) Discuss the types of retaining walls with the help of neat sketches.   (5)

   (b) What is Rankine's Theory of calculating earth pressure on retaining walls?   (5)

4. Design the vertical stem of a T- shaped retaining wall for a height of 3 m above the ground level. The top of the earth retained is surcharged at 10° with the horizontal. The angle of repose of the earth is 29° and its density is 17 kN/m^3. The safe

bearing capacity of the soil is 100 kN/m^2 and coefficient of friction between concrete and soil is 0.55.   (10)

SECTION - C

5. Design a circular tank for a capacity of 400 Kilolitres with flexible base i.e. walls and base slab are not monolithic with each other. Use mild steel bars for reinforcement. Assume depth of the tank 3m and free board as 300 mm.   (10)

6. Design an underground rectangular tank of 10m x 6m x 3m deep. The tank is covered at the top. Take density of soil as 16000 N/m^3 and angle of repose as 30°. The outside soil which is 0.3m below the top of the tank wall may be taken as fully saturated up to its full height.   (10)

SECTION - D

7. What are the general design details adopted for ensuring ductility in shear walls?   (10)

8. What are the design and detailing requirements of columns in earthquake resistant design?   (10)

SECTION - E

9. (a) Draw the pressure variation in deep foundations laid on clayey soil.

   (b) What are gravity retaining walls?

   (c) Define the term 'Ductility' in structures.

   (d) Draw a typical cross-section of a buttress wall.

   (e) List various causes of failures of foundations.

   (f) What are the factors that affects the curvature ductility?

   (g) What do you understand by 'Safe bearing pressure'?

   (h) Why shear key is provided in retaining walls?

   (i) What are the desirable properties of a movement joint?

   (j) Define Cast-in-situ concrete piles.   (10×2=20)