

(Compulsory Question)

9. (a) What is eccentrically loaded footing ?  
(b) Draw the typical cross-section of a counterfort wall.  
(c) Define active and passive earth pressure.  
(d) Draw pressure variation in shallow foundation in sandy soil.  
(e) Define curvature ductility.  
(f) What do you understand by 'soft storey' in structures ?  
(g) Define friction piles.  
(h) What are the assumptions made in the design of the foundation ?  
(i) Draw the cross-section of a typical expansion joint.  
(j) What are buttressed retaining walls ?  $2 \times 10 = 20$

**July-22-00346**

B.Tech. EXAMINATION, 2022

Semester VI (CBCS)

DESIGN OF CONCRETE STRUCTURES-II

CE-601

*Time : 3 Hours*

*Maximum Marks : 60*

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

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**Note :** Attempt *Five* questions in all, selecting *one* question from each Sections A, B, C and D. Q. No. **9** is compulsory. Relevant codes are allowed. Assume any missing data.

**Section A**

1. Discuss in detail various types of foundations with neat sketches. 10

2. A reinforced footing wall 150 mm thick is to carry a load of 400000 N/m run of the wall. Design the footing if the bearing capacity of the soil is 20 t/m<sup>2</sup>. Assume any missing data. **10**

### Section B

3. (a) What are the general design requirements to be satisfied by a retaining wall in order to avoid failure ? **5**
- (b) What is Coulomb's Theory of calculating earth pressure on retaining walls ? **5**
4. Determine the dimensions of a T-shaped retaining wall for a height of 4 m above the ground level. The top of the earth retained is surcharged at 20° with the horizontal. The angle of repose of the earth is 35° and its density is 19 kN/m<sup>3</sup>. The safe bearing capacity of the soil is 80 kN/m<sup>2</sup> and coefficient of friction between concrete and soil is 0.55. Assume any missing data. **10**

### Section C

5. Design a circular tank 13.75 m diameter and 3.0 m height of the wall. The tank rests on a firm ground. The walls are fixed at base and free at the top. Assume free board = 0.3 m. Design the tanks as per Indian standards. **10**
6. Design an underground reservoir 12 m × 5 m × 2.8 m deep including a free board of 0.3 m. The dry design of soil is 16000 N/m<sup>3</sup> and the angle of repose of dry soil is 30°. The outside soil which is 0.3 m below the top of the tank wall may be taken as fully saturated up to its full height. **10**

### Section D

7. What is the significance of the ductility in a reinforced concrete structure ? Also, discuss the various factors that affect the ductility. **10**
8. What are the design requirements of flexural members in ductile frames ? **10**