K. K. Wagh Institute of Engineering Education & Research, Nashik

(An Autonomous Institute From A.Y. 2022-23)

WINTER-2025	
Exam Seat No.:	
Academic Year:2025-2026	Semester:VII
Class:FINAL	Program:B.Tech
Branch Code:CIV	Pattern:2022
Name of Course:Design of Concrete Structures	Course Code:CIV224021
Max. Marks:60	Duration:2.30 Hrs.

Instructions: Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.

1. This question paper contains two page(s).
2. Answer to each new question is to be started on a new page.
3. Assume suitable data wherever required, but justify it.
4. Draw the neat labelled diagrams, wherever necessary.
5. The last columns indicates the Course Outcome of the Question/sub-question.
6. Use of IS 456:2000, IS 3370:2009 (Part1, 2, 4) is allowed

		Marks	CO
Question No. 1			
1a)	For a T-shaped retaining wall, draw the active earth pressure diagram and show the expression for maximum earth pressure for the following conditions i) Backfill with sloping surface ii) Backfill is horizontal with a uniform surcharge	(6)	CO2
Question No. 2			
2a)	Design a footing for a column carrying an ultimate load of 250 kN and ultimate moment of 55 kN.m about the major axis. The column size is 300mm x 450mm. the safe bearing capacity of soil is 150 kN/m^2. Use M25 and Fe 500. Need not to show the reinforcement details. Neglect two way and one way shear checks.	(6)	CO2
Question No. 3			
3a)	Explain what a flat slab is and the different types of flat slab.	(6)	CO3
	OR		
3b)	Explain what a flat slab is and the advantages of flat slab construction.	(6)	CO3
3c)	Design an interior panel of a flat slab for a live load of 4kN/m^2 and floor finish 1 kN/m^2. The panels are 5.5m×5.5m. The diameter of the supporting column is 450 mm. Use M25 and Fe 500. Neglect checks.	(10)	CO3
	OR		
3d)	Design an interior panel of a flat slab for a live load of 4kN/m^2 and floor finish 1 kN/m^2. The panels are 6.4 m×6.4 m. The diameter of the supporting column is 450 mm. Use M25 and Fe 415.	(10)	CO3
Question No. 4			
4a)	What are the assumptions in yield line theory?	(6)	CO4

OR

4b) What are the guidelines for predicting the yield line pattern? (6) CO4

4c) The two-way reinforced concrete slab is supported as shown in Figure 4(c). Determine the ultimate moment using yield line theory when the slab is subjected to a load of 10 kN/m^2. (10) CO4

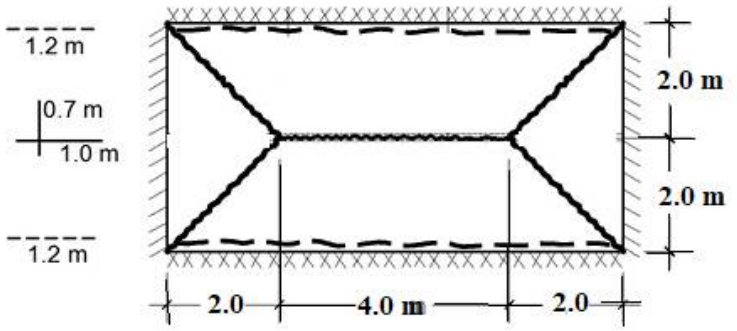

Figure 4(c)

OR

4d) Determine the load capacity of the one way uniformly loaded continuous slab of span 10m. The resisting moments support A, support B and in the span region are 8 kN.m/m, 6 kN.m/m and 5 kN.m/m respectively. (10) CO4

Question No. 5

5a) Using coefficients from IS 3370, determine the bending moments for a rectangular water tank of height 6.4 m, Length 9.6 m and Width 8m. The tank wall is free at the top and fixed at the bottom. (6) CO5

OR

5b) Using coefficients from IS 3370, determine the bending moments for a rectangular water tank of size 6.5m × 4.0m × 3.5m high. The tank wall is free at the top and fixed at the bottom. (6) CO5

5c) Design a rectangular water tank open at the top, resting on ground having a size of 9.6m × 8.0m × 6.4m high. Use M30 and Fe 500 grade material. Use the IS code method. (Design of base slab and reinforcement detailing is not required). (10) CO5

OR

5d) Design a rectangular water tank open at the top, resting on ground having a size of 9.6m × 8.0m × 6.4m high. Use M30 and Fe 500 grade material. Use the Approximate code method. (Design of base slab and reinforcement detailing is not required). (10) CO5

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