



K. K. Wagh Institute of Engineering Education & Research, Nashik
(An Autonomous Institute From A.Y. 2022-23)

SUMMER-2024	
Exam Seat No.:	
Academic Year:2023-2024	Semester: II
Class: F.Y	Program: M.Tech
Branch Code: CIV	Pattern:2022
Name of Course: Advanced Design of Concrete Structures	Course Code:CIV225109
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 2 pages.
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 and level of Blooms Taxonomy of the Question/sub-question.

Question No. 1 Attempt following Question

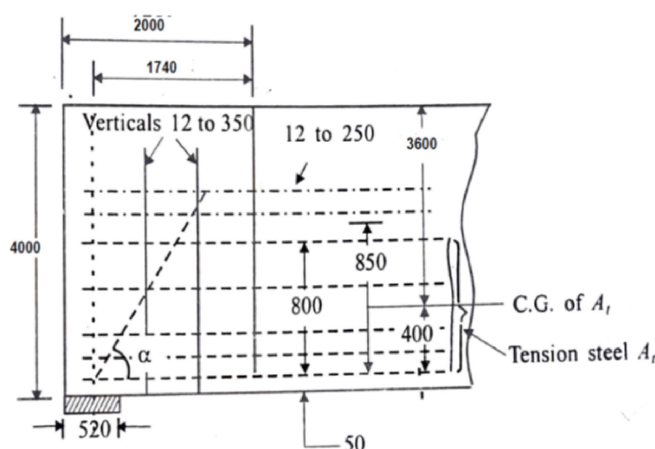
- 1a) What are the characteristic features of yield lines and draw the yield line pattern of rectangular slab (6) CO1,
for one edge is simply supported and remaining edges are rest on two column support. CO2

Question No. 2 Attempt following Question

- 2a) Write advantages and disadvantage of flat slab. (6) CO1

Question No. 3 Attempt following Question

- 3a) Determine the thickness and reinforcements for a simply-supported transfer girder of length 5.25 m (8) CO1,
loaded from two columns at 1.75 m from each end with 3750 kN (see Fig.). The total depth of the beam is 4.2 m and the width of supports is 520 mm. Assume grade 40 concrete and Fe 415 steel. CO2,
(Design of simply-supported deep beam). (Shear check and R/F detailing not required). CO3



OR

- 3b) A semi-circular beam with radius of 4 m is simply supported at ends, and is continuous over a column at its middle. The beam carries a uniformly distributed load of 20 kN/m length of the beam, inclusive of its own weight. Determine S.F., B.M. and T.M. at salient points. (8) CO1, CO2, CO3
- 3c) Write a note on Indian standard code for design for torsion for design of beams curved in plan (IS 456). (8) CO1

OR

- 3d) Write down the design step for simply-supported deep beam. (8) CO1

Question No. 4 Attempt following Question

- 4a) Design a circular water tank with flexible base resting on the ground to store 50,000 litres of water. The depth of tank may be kept 4 m. Use M25 concrete and Fe-415 steel. (8) CO3, CO4

OR

- 4b) Design a rectangular water tank of 150m³ capacities that rest on ground and its vertical edge fix, bottom edge fix and top is free. Use M25 grade of concrete and Fe 415 Steel. (8) CO3, CO4

- 4c) What is the general requirement of water tank according to IS 3370 part – I & II. (8) CO3

OR

- 4d) Write down the design step of circular water tank rest on ground by IS code method. (8) CO3

Question No. 5 Attempt following Question

- 5a) A R.C. column, 400mm x 400mm carrying a load of 600kN is supported on three piles 400mm x 400mm in section. The centre to centre distance between the piles is 1.5m. Design a suitable pile cap. Use M-15 concrete. (8) CO3, CO4

OR

- 5b) Write down the design step for rectangular slab footing for two columns (combined footing). (8) CO3, CO4

- 5c) Write short note on group action of pile. (8) CO3

OR

- 5d) Write down the different type of combined footing, explain any one. (8) CO3

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