



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

SUMMER-2023

Exam Seat No.:

Academic Year:2022-2023

Semester: II

Name of Programme: M.Tech

Pattern:2022

Name of Course: Advanced Design of Concrete Structures

Course Code:CIV225109

Max. Marks:60

Duration:2.30

**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 03pages.
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
6. IS 456:200 and IS 3370 are allowed in examination.

**Question No. 1 Attempt following Question**

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

**Question No. 2 Attempt following Question**

- 2a) Explain the methods of determination of bending moment and shear force of flat slab. (6) CO2

**Question No. 3 Attempt following Question**

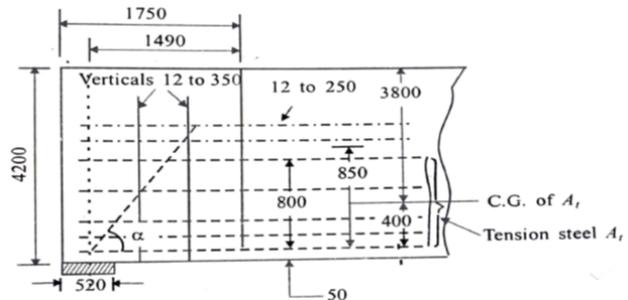
- 3a) (8) CO3  
A semi-circular beam with radius of 4 m is simply supported at ends, and is continuous over a column at its middle. The beam carries a uniformly distributed load of 20 kN/m length of the

beam, inclusive of its own weight. Determine S.F., B.M. and T.M. at salient points.

**OR**

3b)

Determine the thickness and reinforcements for a simply-supported transfer girder of length 5.25 m 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. (Design of simply-supported deep beam). (Shear check and R/F detailing not required)



(8) CO3

3c)

Write a short note on design for torsion for design of beams curved in plan (As per IS 456:200)

(8) CO3

**OR**

3d)

Write down the design step for simply-supported deep beam by ACI Methods.

(8) CO3

**Question No. 4 Attempt following Question**

4a)

Design a circular water tank with joint between wall and base slab is rigid resting on the ground to store 50,000 litres of water. The depth of tank may be kept 4m. Use M-25 concrete and Fe-415 steel.

(10) CO4

**OR**

4b)

Design of Circular water tank of 150m<sup>3</sup> capacities that rest on ground. The tank having circular shape which is free at top and fix at base. Use M25 grade of concrete and Fe 415 Steel.

(10) CO4

4c)

Write down the design step of rectangular tank rest on ground by IS code method.

(6) CO4

**OR**

4d)

What are different types of water tank explain any one in details.

(6) CO4

**Question No. 5 Attempt following Question**

5a)

Write down the design step for beam and slab type footing for columns.

(10) CO5

**OR**

- 5b) Design a pile under a column transmitting an axial load of 600kN. The pile is to be driven to a hard stratum available at a depth of 8 metres. Take  $\sigma_{cc} = 4 \text{ N/mm}^2$  and  $\sigma_{sc} = 130 \text{ N/mm}^2$ . (10) CO5
- 5c) Explain different types of combined footing along with their suitable application. (6) CO5

**OR**

- 5d) Write down the different type of piles, explain any one. (6) CO5