



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	

	<p>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.</p> <ol style="list-style-type: none">1. This question paper contains 03 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-question6. IS 456:2000 and IS 3370 are allowed in examination.	
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Question No. 1 Attempt following Question

1a)

The triangular slab ABC of side AB= 3m , BC = 4m and angle between ABC = 60° is simply supported about edges AB and BC and is isotopically reinforced with 10mm bars with 200mm c/c spacing. The average effective depth for reinforcements is 100mm and overall depth of slab is 125mm. Determine the live load it can carry, if finishing load is 0.8 kN/m^2 . Given If M-20 and Fe-415 steel used. (6) CO1

Question No. 2 Attempt following Question

2a) Explain the various methods for the analysis of grid floors. (6) CO2

Question No. 3 Attempt following Question

3a)

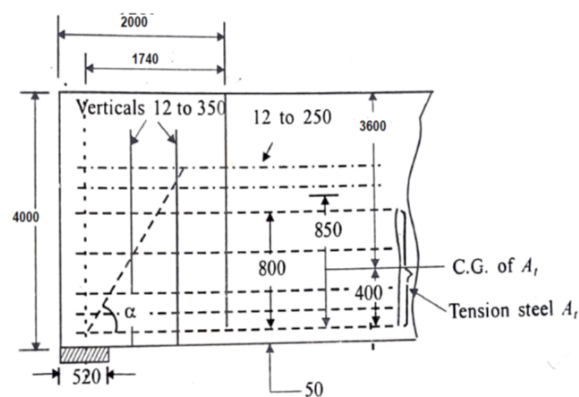
A curved beam is in the form of a full continuous circle in plan with a radius of 4 m and is supported continuously on six supports. The beam carries a uniformly distributed load of 2 kN/m length, inclusive of its own weight. Determine the bending moment, twisting moment and shear force at salient locations.

(8) CO3

OR

3b)

Determine the thickness and reinforcements for a simply-supported transfer girder of length 6.25 m loaded from two columns at 2.0 m from each end with 3750 kN (see Fig.). The total depth of the beam is 4.0 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 down the design step for simply-supported deep beam by ACI Methods.

(8) CO3

OR

3d) Write short note on Indian standard code for design for torsion for design of beams curved in plan (As per IS 456:2000).

(8) CO3

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.

(10) CO4

OR

4b) 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 4 m. Use M25 concrete and Fe-415 steel.

(10) CO4

4c) What are the different types of water tank and explain any one in details.

(6) CO4

OR

4d) Write down the design step of rectangular tank rest on ground by IS code method.

(6) CO4

Question No. 5 Attempt following Question

5a)

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

OR

5b) Write down the design step for beam and slab type footing for two columns. (10) CO5

5c) Write short note on group action of pile. (6) CO5

OR

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