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:VI
Class:TY	Program:B.Tech
Branch Code:CIV	Pattern:2022
Name of Course:Foundation Engineering	Course Code:CIV223012
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 and level of Blooms Taxonomy of the Question/sub-question.

		Marks	CO
Question No. 1			
1a)	Enlist different types of samplers and explain any one in detail with neat sketch.	(6)	CO1
Question No. 2			
2a)	Discuss (i) Floating foundation (ii) Bearing capacity of layered soil.	(6)	CO2
Question No. 3			
3a)	Write a note on (i) Pressure bulb (ii) Contact pressure.	(5)	CO3
	OR		
3b)	Identify the use square root of time fitting method for determination of coefficient of consolidation.	(5)	CO3
3c)	Define differential settlement. Explain causes & techniques to reduce it.	(5)	CO3
	OR		
3d)	Illustrate the concept of Terzaghi's consolidation theory.	(5)	CO3
3e)	A layer of soft clay 3 m thick lies under a newly constructed building. The effective pressure due to overlying strata on the clay layer is 200 KN/m^2 and new construction increases the overburden by 120 KN/m^2. If the compression index of the clay is 0.45, compute the settlement, assuming the void ratio as 0.6.	(6)	CO3
	OR		
3f)	The laboratory test gives time of 80% consolidation as 20 minutes on a 10 mm thick specimen (double drainage-floating ring). Determine the time required for 50% consolidation for a clay bed 3 m thick with single face drainage.	(6)	CO3
Question No. 4			
4a)	Write a note on pile load test & interpretation of test results.	(5)	CO4
	OR		

4b)	Make use the concept of field rule to calculate the efficiency of pile group.	(5)	CO4
4c)	Explain with neat sketch negative skin friction on pile.	(5)	CO4

OR

4d)	Justify the need of various classification of pile.	(5)	CO4
4e)	A reinforced concrete pile weighing 30 kN (inclusive of helmet and dolly) is driven by a drop hammer weighing 40 kN and having an effective fall of 0.8 m. The average set per blow is 1.4 cm. The total temporary elastic compression is 1.8 cm. Assuming the coefficient of restitution as 0.25 and a factor of safety 2, determine the ultimate bearing capacity and allowable load for the pile.	(6)	CO4

OR

4f)	A group of 9 piles with 3 piles in a row was driven in to soft clay extending from ground level to great depth. The diameter and length of piles were 0.5 m and 20 m respectively. The UCS of clay is 30 kN/m^2. If the piles were spaced at 0.9 m centre to centre, compute the allowable load on the pile group on the basis of shear failure of shear failure criteria for a factor of safety of 2.5. Neglect bearing at the tip of piles. Take m = 0.6 for shear mobilization around each pile.	(6)	CO4

Question No. 5

5a)	Describe the principals involved in the design of a shallow footing.	(5)	CO5

OR

5b)	Analyze the causes and effects of tilt and shift in well foundations.	(5)	CO5
5c)	List down the steps involved in proportioning of footing.	(5)	CO5

OR

5d)	Write down the components of well foundation with neat sketch.	(5)	CO5
5e)	Analyze how bearing capacity affects the choice of shallow foundation type.	(6)	CO5

OR

5f)	Illustrate the use of different caisson types for bridge foundation design.	(6)	CO5

····· End of question paper·····