
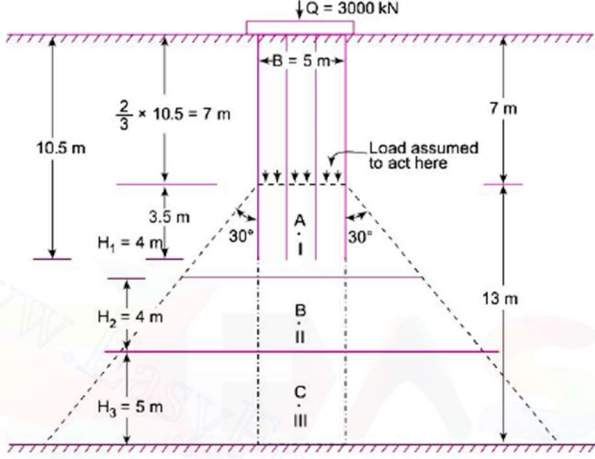
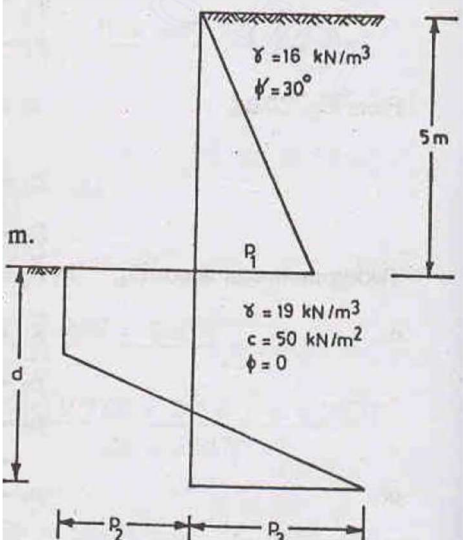


Name:			
Enrolment No:			
UPES End Semester Examination, May 2024			
Course: Advanced Foundation Design Program: B Tech Civil Engineering Course Code: CIVL 3069		Semester : VI Time : 03 hrs. Max. Marks: 100	
Instructions: Assume suitable data if required and mention clearly.			
SECTION A (5Qx4M=20Marks)			
S. No.		Marks	CO
Q 1	A purely cohesive soil was tested by unconfined compression. The unconfined compression strength was obtained as 100 kN/m ² . Calculate the net ultimate bearing capacity utilizing Terzaghi's theory and general shear failure. (Bearing capacity factor $N_c = 5.7$)	4	CO1
Q 2	A timber pile is being driven with a drop hammer weighing 20 kN and having a free fall of 1 m. The total penetration of the pile in the last 5 blows is 30 mm. Determine the load carrying capacity of the pile using the Engineering News Formula.	4	CO2
Q 3	List various uses of sheet pile wall in construction.	4	CO3
Q 4	State the use and types of drilled pier foundation.	4	CO3
Q 5	A mass supported by a spring oscillates at a natural frequency of 12.89 Hz. Determine the corresponding static deflection of the mass.	4	CO4
SECTION B (4Qx10M= 40 Marks)			
Q 6	Compare general, local, and punching shear failure.	10	CO1
Q 7	Discuss with neat sketch the types of piles according to function. OR Describe in detail how bearing capacity of pile can be assessed using static method.	10	CO3
Q 8	Illustrate any three types of cofferdams with neat sketch and mentioning their importance.	10	CO3
Q 9	(a) Write a short note on viscous damping. (b) Derive the standard equation of motion for undamped free vibration of a spring-mass system.	4+6	CO4
SECTION-C (2Qx20M=40 Marks)			

<p>Q 10</p>	<p>(a) Discuss different methods for pile installation.</p> <p>(b) Compute the settlement of the friction pile group, as shown below, at a site in uniform clay to a depth of 20 m underlain by rock. Use the following design data: Normally loaded and normally sensitive clay with 60% liquid limit, initial void ratio is 1.0 and unit weight of 16 kN/m^3.</p>  <p style="text-align: center;">OR</p> <p>(a) Describe in detail how bearing capacity can be assessed from Pile Load Test.</p> <p>(b) An RCC pile of 18 m overall length is driven into a deep stratum of soft clay having an unconfined compressive strength of 35 kN/m^2. The diameter of the pile is 30 cm. Determine the safe load that can be carried by the pile with a factor of safety 3.0.</p>	<p style="text-align: center;">8+12</p> <p style="text-align: center;">OR</p> <p style="text-align: center;">10+10</p>	<p style="text-align: center;">CO2</p>
<p>Q 11</p>	<p>(a) Illustrate any three types of caisson foundation with neat sketch and mentioning their functions.</p> <p>(b) Determine the depth of embedment for the cantilever sheet pile shown in the figure:</p> 	<p style="text-align: center;">10+10</p>	<p style="text-align: center;">CO3</p>