

	properties $\gamma=1.75\text{t/m}^3$ , $\phi=20^\circ$ , $c_u=1.15\text{t/m}^2$ . Applying Terzaghi's theory, calculate the Ultimate bearing capacity if  i. Water table is at the ground surface. ii. Water table is 1m below ground level. iii. Water table is 2m below ground level surface. iv. Water table is 3m below ground level surface (Given: $N_c'=9.23$ , $N_q'=2.5$ , $N_\gamma'=0.8$ ).			
3 (c)	Construct a strip footing to carry a load of 735kN/m at a depth of 1.6m in a c- $\phi$ soil having a unit weight of 18kN/m <sup>3</sup> and shear strength parameters as $c=20\text{kN/m}^2$ and $\phi=25^\circ$ . Determine the width of the footing, using a factor of safety of 3 against shear failure. (Given: $N_c=25.1$ , $N_q=12.7$ , $N_\gamma=9.7$ )	7	CO 3	BT 3

Q. No.	Answer any two of the following (Within 300 words each)	Marks	CO	BT Level
4 (a)	Explain the two mechanisms of pile group failure installed in clayey soil deposit.	7	CO 2	BT 2
4 (b)	A pile 12m in length and 300mm diameter is proposed to be driven in a uniform sand deposit where value of $\phi'=40^\circ$ and average dry unit weight $\gamma_d=18\text{kN/m}^3$ . The natural water table is at a great depth and is not expected to rise. Applying the static pile load theory, calculate the safe load capacity of the pile with a factor of safety 2.5. Given value of $N_q$ is 137.	7	CO 3	BT 3
4 (c)	It is proposed that 8m long 200mm diameter pile shall be used as a foundation for medium clay deposit having $q_u=100\text{kN/m}^2$ . 9 piles are there arranged in square pattern with 500mm spacing between piles. Assuming adhesion factor of 0.9, interpret the ultimate capacity of pile group.	7	CO 2	BT 2

Q. No.	Answer any two of the following (Within 300 words each)	Marks	CO	BT Level
5 (a)	Explain the detail mechanism of behavior of swelling soils.	7	CO 2	BT 2
5 (b)	Interpret the expression for earth pressure at rest condition when soil mass is located below the water table.	7	CO 2	BT 2
5 (c)	Summarize the different types of Geosynthetics along with its application and advantages.	7	CO 2	BT 3

Course Outcomes	Marks Allotted	Percentage
CO1	10	Approx 61%
CO2	49	
CO3	23	Approx 24%
CO4	15	Approx 15%