Question Paper Code: R18A32CE04

R18

ANURAG Engineering College

(An Autonomous Institution)

III B.Tech II Semester Supplementary Examinations, December-2024

FOUNDATION ENGINEERING

(CIVIL ENGINEERING)

Time: 3 Hours **Max. Marks: 75**

Section – A (Short Answer type questions) (25 Marks)

Answer All Questions		Course Outcome	B.T Level	Marks
1.	List out factor of safety of infinite slopes?	CO1	L1	2M
2.	What are various methods of soil exploration	CO1	L2	3M
3.	List out types of retaining wall?	CO2	L1	2M
4.	Enumerate the assumptions made in Rankine's theory.	CO2	L2	3M
5.	Define ultimate and net ultimate bearing capacity of soil?	CO3	L2	2M
6.	Discuss limitations of plate load test	CO3	L3	3M
7.	Define the term Settlement.	CO4	L2	2M
8.	Write about location and depth of foundation?	CO4	L3	3M
9.	Define well foundation?	CO5	L2	2M
10.	Write about different types of well foundation?	CO5	L3	3M

Section B (Essay Questions)

Answer all questions, each question carries equal marks. **(5 X 10M = 50M)**

11. A)	Explain any two methods of soil exploration in detail.	CO1	L2	10M
	OR			
B)	Explain briefly about standard cone penetration test?	CO1	L2	10M
12. A)	A retaining wall with a smooth vertical back is 10 m high and retains a two layer sand backfill with the following properties: 0 - 5 m depth: $\phi = 30^\circ$, $\gamma = 18$ kN/m^3 Below 5 m: $\phi = 34^\circ$, $\gamma = 20$ kN/m^3 Show the active earth pressure distribution assuming the water table is well below the base of wall	CO2	L3	10M
	OR			
B)	Describe the Culmann's graphical method of determining the active earth pressure in cohesion less soils.	CO2	L3	10M
13. A)	A square footing of 1.8 m size is placed over a sand of bulk density 20 kN/m^3 and saturated density 22 kN/m^3 at a depth of 1.0 m below ground. The angle of internal friction of sand is 30°. The Terzaghi's bearing capacity factors N_c=30.14, N_q=18.4 and N_γ=15.1. Determine the ultimate bearing capacity of the soil when there is no effect of water table and when the water table is at base.	CO3	L3	10M
	OR			
B)	Explain briefly about plate load test as per IS specifications?	CO3	L2	10M
14. A)	Explain briefly about bearing capacity criteria according to mayerhof's assumptions?	CO4	L2	10M
	OR			

B)	A plate load test was conducted with a 30 cm square plate at a depth of 1.2 m below the ground level, in a cohesive soil having $\Phi = 0$. The failure was observed at a load of 36 kN. The water table was observed to be at a depth of 4.7 m below ground surface. Compute the ultimate bearing capacity for a strip footing, 1m wide with its base located at the same level as the test plate, and in the same soil. Take the bulk unit weight of the soil as 16.8 kN/m^3. Also, calculate the safe bearing capacity of factor at a safety of 3.	CO4	L3	10M
15. A)	A group of 16 piles of 50 cm diameter is arranged with a center to center spacing of 1 m. The piles are 9 m long and are embedded in soft clay with cohesion 30 kN/m^2. Bearing resistance may be neglected for the piles. Adhesion factor is 0.6. Determine the ultimate load capacity of the pile group.	CO5	L3	10M
	OR			
B)	Explain briefly about components of well foundation?	CO5	L2	10M