b.	Describe the detail procedure of plate load test with neat sketch.	10	2	2	1
28. a.	Describe the detail procedure to design the rectangular and trapezoidal combined footing.	10	3	3	3
	(OR)				
b.	Briefly describe the causes and remedial measures of differential settlement.	10	2	3	1
29. a.	The 16 pile square group having the pile dia is 0.4m and centre to centre spacing of pile is 1.5m. If C=50 kN/m^2, neglect the bearing at the tip of pile. All piles are 12m long and adhesion factor is 0.7. Determine the safe load of the group pile. Take FOS=3.	10	4	4	2
	(OR)				
b.	Explain the detail procedure to conduct the pile load test with neat sketch.	10	2	4	1
30. a.	A retaining wall with smooth vertical back retains cohesionless soil of 12m. The soil consists of two layers. The top layer is 6 m thick. The properties of soil are Top layer $\phi = 28°$ $\gamma = 18$ kN/m^3 H=6m Bottom layer $\phi = 32°$ $\gamma = 21$ kN/m^3 H=4m Use Rankine's theory to determine magnitude and position of active earth pressure.	10	5	5	2
	(OR)				
b.	Explain with neat sketch the Culmann's graphical method of calculating the active earth pressure.	10	4	5	1

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Reg. No.														

B.Tech. DEGREE EXAMINATION, NOVEMBER 2022
Sixth Semester

18CEE301T – FOUNDATION ENGINEERING AND DESIGN
(For the candidates admitted from the academic year 2018-2019 to 2019-2020)

Note:
(i) **Part - A** should be answered in OMR sheet within first 40 minutes and OMR sheet should be handed over to hall invigilator at the end of 40th minute.
(ii) **Part - B** should be answered in answer booklet.

Time: 2½ Hours Max. Marks: 75

	Marks	BL	CO	PO
PART – A (25 × 1 = 25 Marks) Answer **ALL** Questions				
1. The static cone penetration test is used to determine (A) End bearing resistance (B) Frictional resistance (C) End bearing and frictional resistance (D) Safe bearing pressure	1	1	1	1
2. The weight of hammer used in the standard penetration test to drive the sampler is (A) 60 kg (B) 63.5 kg (C) 65 kg (D) 70.50 kg	1	1	1	1
3. The outer electrodes used in the electrical resistivity method are known as (A) Potential electrodes (B) Current electrodes (C) Resistivity electrodes (D) Conductivity electrodes	1	1	1	1
4. As per Indian standard guidelines, the depth of soil exploration for a square footing should be atleast (A) Width of footing (B) 1.5 times width of footing (C) 2 times width of footing (D) 3 times width of footing	1	1	1	1
5. The apex angle of the clutch cone in the cone penetration test is (A) 30° (B) 45° (C) 60° (D) 90°	1	1	1	1
6. Which of the following shear failure comes under the category of sudden and catastrophic failure? (A) General shear failure (B) Local shear failure (C) Punching shear failure (D) Dense shear failure	1	2	2	1
7. Pick the net ultimate bearing capacity equation by Skempton method for strip footing where S is cohesion, N_C is bearing capacity factor due to cohesion, γ is density of soil and D is depth of foundation. (A) CN_C (B) $1.3CN_C$ (C) $CN_C + \gamma_D$ (D) $1.3CN_C + \gamma_D$	1	2	2	1

8. The seating load that will be generally applied in the plate load test is 1 2 2 1
(A) 2 kN/m^2 (B) 5 kN/m^2
(C) 7 kN/m^2 (D) 10 kN/m^2

9. The Terzaghis bearing capacity factor due to cohesion N_C for pure cohesion soil is $\phi = 0$ is 1 2 2 1
(A) 5.14 (B) 5.7
(C) 7.5 (D) 9

10. Which of the following method is adopted for the loading on the plate for plate load tests as per IS:1888:1982? 1 2 2 1
(A) Gravity loading platform (B) Truss joint method
(C) Sand bags (D) Concrete blocks

11. Which type of foundation is adopted when the footings of the adjacent columns are too close or overlap with each other? 1 2 3 1
(A) Strip footing (B) Strap footing
(C) Combined footing (D) Mat foundation

12. The immediate settlement can be computed from the expression, based on 1 1 3 1
(A) Theory of plasticity (B) Theory of elasticity
(C) Terazghi's analysis (D) Rankine's theory

13. The compression of soil occurs due to the rearrangement of soil particles is called as 1 1 3 1
(A) Immediate settlement (B) Primary settlement
(C) Secondary settlement (D) Tertiary settlement

14. The type of slope failure that occurs for an infinite slope is 1 1 3 1
(A) Toe failure (B) Slope failure
(C) Base failure (D) Translational failure

15. In the slope stability analysis, the Swedish slip circle of method of slices is applied to 1 2 3 1
(A) Cohesive soil (B) Cohesionless soil
(C) C-ϕ soil (D) Hard rock

16. The value of bearing capacity factor due to cohesion (N_C) for piles in pure clay is 1 2 4 1
(A) 5.17 (B) 5.7
(C) 7.5 (D) 9

17. The bulb provided at the bottom of the pile is 1 1 4 1
(A) Floating pile (B) Fender pile
(C) Belled pier (D) Underreamed pile

18. Negative skin friction in soil is considered when the pile is constructed through 1 1 4 1
(A) Compacted soil (B) Dense coarse sand
(C) Recent fill materials (D) Over consolidated stiff soil

19. In the pile load test, the load is applied on the increment of _____. 1 1 4 1
(A) 10% of safe load (B) 15% of safe load
(C) 20% of safe load (D) 25% of safe load

20. The ultimate load carrying capacity of pile is calculated from 1 1 4 1
(A) End bearing resistance (B) Frictional resistance
(C) End bearing and frictional resistance (D) Safe bearing pressure

21. The lateral earth pressure exerted by the soil when the retaining wall moves away from the backfill. 1 1 5 1
(A) Active earth pressure (B) Passive earth pressure
(C) Earth pressure at rest (D) Total earth pressure

22. The value of earth pressure is minimum for 1 2 5 1
(A) Passive state (B) Active state
(C) Atrest state (D) Lateral state

23. Which one of the followings are the graphical methods, suitable to determine the earth pressure distribution? 1 1 5 1
(A) Taylor's method (B) Culmann's method
(C) Newmark's influence chart (D) Mohr diagram

24. When the retaining wall moves away from the backfill, the pressure exerted on the wall is termed as 1 1 5 1
(A) Active earth pressure (B) Passive earth pressure
(C) Atrest earth pressure (D) Pore pressure

25. The coefficient of active earth pressure is 1/3 what is the value of the coefficient of passive earth pressure 1 2 5 1
(A) 1 (B) 3
(C) 1/3 (D) 1/9

PART – B (5 × 10 = 50 Marks) Marks BL CO PO
Answer **ALL** Questions

26. a. List out the methods to determine the indirect exploration technique. Describe about any one method of the above with neat sketch. 10 3 1 1

(OR)

b. Explain the detail procedure of the standard penetration test with neat sketch? Also list out the SPT corrections. 10 2 1 1

27. a. A square footing of 2m×2m size is laying at a depth of 2m on a uniform clay strata having C=30 kN/m^2 and γ=18kN/m^3. Find the safe bearing capacity of the foundation with FOS=3. Also compute the safe bearing capacity of the foundation when the water table rises to the ground level. Take γ=10kN/m^3. 10 4 2 2

(OR)