Register No : _____

THE KAVERY ENGINEERING COLLEGE

(An Autonomous Institution)

B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, NOV/DEC 2025

Fifth Semester

Civil Engineering

CE3503- Foundation Engineering

Regulations - 2021

Duration : 3 Hrs *Maximum : 100 Marks*

*PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)*

Q.No	*Questions*	*BTL*	*CO*	*Marks*
1.	List the merits of wash boring.	L1	1	2
2.	Define depth of exploration.	L1	1	2
3.	List the assumptions made in Terzaghi's bearing capacity analysis.	L1	2	2
4.	Differentiate between total settlement and differential settlement.	L2	2	2
5.	Where can be the raft or mat foundation adopted?	L1	3	2
6.	What do you mean by buoyancy raft foundation?	L1	3	2
7.	Define negative skin friction.	L1	4	2
8.	Mention the reasons for conducting initial tests on piles.	L1	4	2
9.	Sketch the variation of earth pressure and coefficient of earth pressure with the movement of the wall.	L2	5	2
10.	Find the lateral earth pressure coefficient on a basement wall supports soil to a depth of 2 m. Unit weight and angle of shearing resistance of retained soil are 16 kN/m^3 and 32° respectively.	L2	5	2

*PART – B (ANSWER ALL QUESTIONS) (Marks 5*16 = 80)*

Q.No		*Questions*	*BLT*	*CO*	*Marks*
11.	a	Describe the principle and procedure for conducting sub soil exploration study using seismic refraction method.	L2	1	16
		Or			
	b	Elaborate the process of borehole before conducting SPT to avoid disturbance and ensure accurate results.	L2	1	16
12.	a	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 Φ = 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.	L3	2	16
		Or			
	b	Demonstrate the elastic and plastic equilibrium zones as per Terzaghi's bearing capacity analysis.	L3	2	16

13.	a	Design a rectangular combined footing for two columns 5 m apart. The exterior column of size 0.3 m x 0.3 m carries a load of 600 kN and interior column of size 0.4 m x 0.4 m carries a load of 900 kN. The allowable soil pressure is 100 kN/m^2.	L3	3	16
		Or			
	b	Build the choices of different shallow foundations with different site conditions.	L3	3	16
14.	a	A reinforced concrete piles weights 30 kN, is driven by a drop hammer weights 40 kN 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. Assuming coefficient of resistance as 0.25. Determine the safe load using Engineering News Formula and Hiley's Formula.	L4	4	16
		Or			
	b	Examine the design process of pile group for a bridge pier subjected to vertical load and uplift loads, considering soil and loading conditions.	L4	4	16
15.	a	A smooth rigid retaining wall of 6 m high carries a uniform surcharge load of 12 kN/m^2. The backfill is clayey sand possessing the following properties are γ = 16.0 kN/m^3, ϕ = 25°, and c = 6.5 kN/m^2. For a retaining wall system, the following data were available: Height of wall = 7 m, Properties of backfill: γ_d =16 kN/m^3, ϕ = 35°, Angle of wall friction, δ =20°, Back of wall is inclined at 20° to the vertical (positive batter), Backfill surface is sloping at 1:10. Find the Active earth pressure and Passive earth pressure.	L4	5	16
		Or			
	b	Compare and contrast Coulomb's wedge theory with Rankine's theory in terms of failure surface geometry, wall friction considerations, and applicability.	L4	5	16