

THE KAVERY ENGINEERING COLLEGE*(An Autonomous Institution)***UG/PG DEGREE END SEMESTER THEORY EXAMINATIONS, APRIL-MAY 2026***Fourth Semester**Civil Engineering***CE3404- SOIL MECHANICS***Regulations - 2021**Duration : 3 Hrs**Maximum : 100 Marks***PART – A(ANSWER ALL QUESTIONS) (Marks 10*2=20)**

Q.No	Questions	BLT	CO	Marks
1.	Draw the Three-phase diagram of the soil system.	L2	1	2
2.	Illustrate the effects of compaction on soil properties.	L2	1	2
3.	Write Darcy's law.	L2	2	2
4.	Differentiate between discharge and seepage velocity.	L2	2	2
5.	Describe Pressure Bulb.	L2	3	2
6.	Differentiate primary and secondary consolidation.	L2	3	2
7.	Explain the angle of repose.	L2	4	2
8.	Explain the basic components that are constituted in the shearing resistance of soil.	L2	4	2
9.	List the various types of failures of finite slopes indicating the situations in which they are likely to occur.	L2	5	2
10.	In slope stability analysis, what is the purpose of the assumptions made?	L2	5	2

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

Q.No	Questions	BLT	CO	Marks
11.	a i Determine the (i) Water content, (ii) Dry density, (iii) Bulk density, (iv) Void ratio and (v) Degree of saturation from the following data : Sample size 3.81 cm dia. × 7.62 cm ht. Wet weight = 1.668 N Oven-dry weight = 1.400 N Specific gravity = 2.7 ii Demonstrate the Core cutter method to find field density of soil. Or b i The in-situ percentage voids a sand deposit is 34 percent. For determining the density index, dried sand from the stratum was first filled loosely in a 1000 cm³ mould and was then vibrated to give a maximum density. The loose dry mass in the mould was 1610 g and dense dry mass at maximum compaction was found to be 1980 g. Determine the density index if the specific gravity of the sand particles 2.67. ii Outline the BIS classification for soil system.	L3	1	8
12.	a A sand deposit 10m thick overlays a clay stratum 11m in thickness. The clay has a void ratio of 0.6 and specific gravity of 2.7. The water table is at a depth of 4m from the ground surface. The submerged sand has a saturated unit weight of 19kN/m² and moist sand above water table has a unit weight of 17kN/m². Calculate the total effective and pore water pressure at the depth of 9m from the surface of clay layer. During rainy season if the water raises by height of 2m, calculate the decreases in	L3	2	16

effective stress at the same depth.

Or

	b	Describe the procedure to find the permeability of soil by laboratory method with neat diagram and derive the expression for coefficient of permeability.	L3	2	16	
13.	a	i	A concentrated load of 30kN acts on the surface of a homogeneous soil mass of large extent. Calculate the stress intensity at a depth of 8m and (i) directly under the load (ii) at a horizontal distance of 6m..	L3	3	8
		ii	A rectangular area 2m x 4m carries a uniformly distributed load of 100kPa at the ground surface. Determine the vertical pressure at 10 m below (i) the centre (ii) one of the corners of the loaded area. Use equivalent point load method	L3	3	8
			Or			
	b	i	A layer of soft clay is 6 m thick and lies under a newly constructed building. The weight of sand overlying the clayey layer produces a pressure of 260 kN/m ² and the new construction increases the pressure by 100 kN/m ² . If the compression index is 0.5, determine the settlement. Water content is 40% and specific gravity of grains is 2.65.	L3	3	8
		ii	Explain the procedure for laboratory Consolidation test with neat diagrams.	L3	3	8
14.	a	Elaborate Direct shear test with neat sketches along with merits and demerits of this test.	L3	4	16	
			Or			
	b	Explain the methods to reduce of liquefaction.	L3	4	16	
15.	a	Analyse the friction circle method of analysis of finite slope of c-φ soil	L4	5	16	
			Or			
	b	In a sloping terrain, it was found that the soil is clayey and weak in nature, suggest any four slope protection methods to stabilize the slope.	L4	5	16	
