

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY-GURUJADA VIZINAGARAM
III B. Tech I Semester Supplementary Examinations November -2025
GEOTECHNICAL ENGINEERING – II
(CIVIL ENGINEERING)

Time: 3 hours

Max. Marks: 70

Answer any **FIVE** Questions **ONE** Question from **Each unit**
All Questions Carry Equal Marks

		<u>UNIT-I</u>	
1.	a)	What are the different methods of soil investigation?	[7M]
	b)	Explain SPT test with corrections	[7M]
		(OR)	
2.	a)	State the points to be considered in preparation of soil investigation report.	[7M]
	b)	.Explain in detail about area ratio, inside and outside clearance of a sampler with a neat sketch.	[7M]
		<u>UNIT-II</u>	
3.	a)	Explain types of slope failures.	[7M]
	b)	Explain Taylor's Stability Number.	[7M]
		(OR)	
4.	a)	How a slope is analyzed using Swedish circle method? Derive an expression for the factor of safety	[7M]
	b)	Determine the depth of tension crack behind a vertical wall 8m high supporting a saturated cohesive backfill with $\Phi_u = 0$ and horizontal surface. The backfill weighs 18kN/m ³ and has an apparent cohesion of 18 kN/m ² .	[7M]
		<u>UNIT-III</u>	
5.	a)	Explain criteria for determination of bearing capacity of shallow foundation.	[7M]
	b)	Design a strip footing to carry a load of 750kN/m at a depth of 1.6m in a cohesive soil having a unit weight of 18kN/m ³ and shear strength parameters are $c = 40\text{kN/m}^2$. Determine the width of the footing using a factor of safety of 3 against shear failure. Use Terzaghi's equation	[7M]
		(OR)	
6.	a)	Explain the I.S. code method for safe bearing of shallow foundation.	[7M]
	b)	A continuous footing of width 2.5 m rests 1.5 m below the ground surface in clay. The unconfined compressive strength of the clay is 150 kN/m ² . Calculate the ultimate bearing capacity of the footing. Assume unit weight of soil is 16 kN/m ³ . For $\Phi = 0^\circ$, Terzaghi's factors are: $N_\gamma = 0$, $N_q = 1$, and $N_c = 5.7$.	[7M]
		<u>UNIT-IV</u>	
7.	a)	Explain in detail about consolidation settlement.	[7M]
	b)	Explain safe bearing pressure calculation based on N- value .	[7M]
		(OR)	
8.	a)	Explain procedure for estimating foundation settlement using plate load test.	[7M]
	b)	Estimate the immediate settlement of a concrete footing 1m X 2m size,	[7M]

		founded at a depth of 1m in a soil with $E=104 \text{ kN/m}^2$, $\mu=0.3$. The footing is subjected to a pressure of 200 kN/m	
		<u>UNIT-V</u>	
9.	a)	Explain any one pile dynamic formula in detail.	[7M]
	b)	A pile is driven with a single acting hammer of weight 20 kN with a free fall of 800mm. the final set, average of three blows is 22.5mm. Find the safe load using the Engineering News Formula.	[7M]
		(OR)	
10.	a)	Explain with a neat sketch different forces acting on well foundations.	[7M]
	b)	What is grip length? How it is fixed for well foundations.	[7M]
