GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–V (NEW) EXAMINATION – WINTER 2021

Subject Code:3150615   **Date:20/12/2021**

Subject Name:Soil Mechanics

Time:02:30 PM TO 05:00 PM   **Total Marks: 70**

Instructions:
1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
   Simple and non-programmable scientific calculators are allowed

Q.1	(a)	Define finite and infinite slopes.	03
	(b)	Explain Culmann's method for stability of slope.	04
	(c)	Write short note on 'Swedish circle method.'	07
Q.2	(a)	Explain the concept of 'Pressure bulb'.	03
	(b)	What do you Under stand by goestatic pressure?	04
	(c)	Determine the factor of safety for a cihesive soil ($\emptyset$ =0) 8 m high ,with stability number 0.156 .The soil has c= 25kN/m2 and unit weight 18.5 kN/m2..	07

<div align="center">OR</div>

	(C)	Explain point to be considered for foundation in black cotton soil.	07
Q.3	(a)	Explain the objectives of subsurface exploration.	03
	(b)	Derive the expression for vertical stress at a point due to live load.	04
	(c)	Explain in detail the construction of Newmark's influence chart. How it is used?	07

<div align="center">OR</div>

Q.3	(a)	What do you understand about disturbed and undisturbed soil sample?	03
	(b)	Write about Boring log.	04
	(c)	Describe the standard penetration test. How the observed N-value is corrected.	07
Q.4	(a)	What is Mohr's strength theory.?	03
	(b)	Compare the direct shear test and triaxial compression test.	04
	(c)	Describe triaxial shear test .What are its merits and demerits?	07

<div align="center">OR</div>

Q.4	(a)	Explain 'types of the shear failure of soil' with neat sketches.	03
	(b)	Enumerate the facters affecting on bearing capacity and explain in detail.	04
	(c)	Describe plate load test with neat sketches.	07
Q.5	(a)	Describe various types of geosynthetics.	03

(b) Explain methods to reduce foundation settlement. 04

(c) A strip footing 2 m wide is to be laid at a depth 3 m in a purely cohesive soil.c = 100 kN/m2..,γ=18 kN/m3..Determine ultimate bearing capacity from (a) Terzaghi's theory (b) Skempton's theory. 07

OR

Q.5 (a) What is negetive skin friction? What is its effect on pile? 03

(b) Explain group action of pile group. 04

(c) Discuss various dynamic formulae for pile. What are their limitations? 07

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