SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester Supplementary Examinations Dec 2019
GEOTECHNICAL ENGINEERING-II
(Civil Engineering)

Time: 3 hours   Max. Marks: 60

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	a	What is site investigation? What are the objectives of site investigation?	8M
	b	What is soil exploration?	4M

OR

2	a	What are different types of soil samples considered for soil testing?	7M
	b	Discuss the salient points of auger boring with a neat sketch.	5M

UNIT-II

3	a	What are different types of slope failures? Explain.	6M
	b	A long natural slope of cohesion less soil is inclined at 12° to the horizontal. Taking $\Phi = 30^o$, determine the factor of safety of the slope. If the slope is completely submerged, what will be change in the factor of safety?	6M

OR

4	How a slope is analyzed using Swedish circle method? Derive an expression for the factor of safety.	12M

UNIT-III

5	a	What are the limiting values of the lateral earth pressure at a depth of 3 m in a uniform sand fill with a unit weight of 20 kN/m3 and a friction angle of 35o? The ground surface is level.	7M
	b	What are different types of earth pressure? Give examples.	5M

OR

6	a	A smooth backed vertical wall is 6.3 m high and retains a soil with a bulk unit weight of 18 kN/m^3 and $\Phi = 18^o$. the top of the soil is level with the top of the wall and is horizontal. If the soil surface carries a uniformly distributed load of 4.5 kN/m^2, determine the total active thrust on the wall per linear metre of the wall and its point of application.	7M
	b	List and explain the stability considerations of a gravity retaining wall.	5M

UNIT-IV

7	a	Describe how the plate load test is conducted with a neat sketch? What are its limitations and uses?	6M
	b	Define the following: (i) Ultimate bearing capacity (ii) Net ultimate bearing capacity	6M

OR

8	a	A foundation in sand will be 5 m wide and 1.5 m deep. Adopting a factor of safety of 2.5 what will be safe bearing capacity if the unit weight of the sand is 1.9 g/cm3 and angle of internal friction is 35o. How does it compare with safe loading capacity for surface loading? Consider NC = 57, Nq = 44 and Nγ = 42.	6M
	b	With neat sketches explain different types of shear failures.	6M

UNIT-V

9   a   How do you estimate group capacity of piles in sand?   **7M**

      b   A pile is driven with a single acting steam hammer of weight 15 kN with a free fall   **5M**
of 900 mm. the final set, the average of the last three blows, is 27.5 mm. Fid the safe
load using the Engineering News Formula.

OR

10   a   What is the effect of negative friction on pile?   **7M**

      b   In a 16 pile group, the pile diameter is 45 cm and centre to centre spacing of the   **5M**
square group is 1.5 m. If c = 50 kN/m2, determine whether the failure would occur
with the pile acting individually, or as a group? Neglect bearing at the tipe of the
pile. All piles are 10 m long. Take m = 0.7 for shear mobilization around each pile.

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