Minufiya University
Faculty of Engineering
Shebin El-Kom
Final Exam
Academic Year: 2019-2020
Department: Civil Eng.

Postgraduate diploma
Subject: Site Investigation
Code: CVE 516
Time allowed: 3 hours
Date: 26/8/2020
Max. Degree: 100

Marks

Question (1): [20]

A Geotechnical Company was asked to prepare a soil report for a new construction site to build a multistory building. As being a civil engineer working in this company:

- State what information is required about the structure and nearby soil. (4)
- Show the factors that should be considered in deciding borehole depths. (6)
- Explain how you can determine the level of ground water table in boreholes. (4)
- Explain how you can stabilize the sides of borehole during subsurface investigation. (6)

Question (2): [20]

a) Draw neat sketches for: (9)
- Wash borings.
- Standard split spoon sampler.
- Piston sampler.

b) Discuss the major problems associated with obtaining undisturbed soil samples in the field. Show how these problems can be reduced. (11)

Question (3): [20]

a) Explain using sketches the types of augers that are commonly used for advancing boreholes. (8)

b) Discuss how you can measure the sample disturbance. (6)

c) Compute the area ratio of a thin walled tube sampler having an external diameter of 8.0 cm and a wall thickness of 3.25mm. Do you recommend the sampler for obtaining undisturbed soil samples? Why? (6)

Question (4): [20]

a) Describe using sketches how Vane Shear Test can be performed. In which type of soil do you recommend this test and what type of results could be obtained? (8)

b) A Standard Penetration Test was conducted on saturated fine sand below the ground water table. The measured SPT value was found to be 29. Does the value represent the true SPT value? Explain. (6)

c) Draw neat sketches for the different types of Cone Penetration Test. What type of results can be obtained for each type? (6)

Question (5):

[20]

a) Describe using sketches the procedure of conducting the plate load test. Explain how to estimate the ultimate bearing capacity and settlement of a footing using the test results (6)

b) In a plate load test using a 30 square plate on a sandy soil under a pressure of 150 KN/m^2, a settlement of 8.0 mm was recorded. What should be the size of a square footing if the settlement of the footing under the same loading intensity is to be restricted to 25.0 mm? (7)

c) Choose the most suitable type and depth of foundations to be constructed on the soil profile shown in Fig (1) for the following structures: (7)

i. A 5-story hospital.
ii. A 15-story office building.

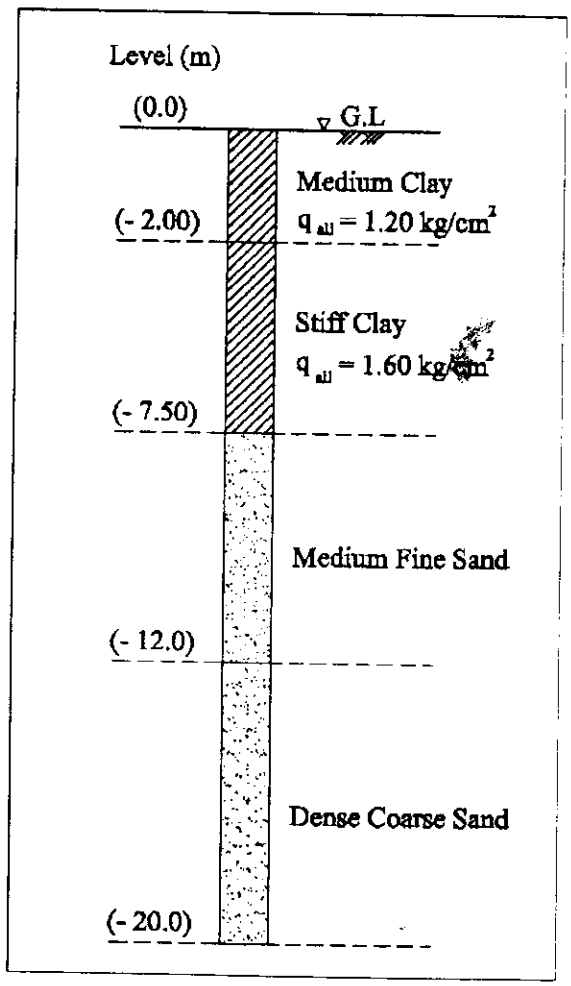

Fig (1)