Minufiya University
Faculty of Engineering
Shebin El-Kom
Final Exam
Academic Year: 2013-2014
Department: Civil Eng.

Postgraduate diploma
Subject: Site Investigation
Code: CVE 516
Time allowed: 3 hours
Date: 16/6/2014
Max. Degree: 100

Marks

Question (1): [20]

a) Explain the various steps of subsurface exploration programme. (10)

b) Discuss how you can reduce sample disturbance. (5)

c) Suggest the required borehole spacing and depth for the following: (5)
- Five story building on erratic soil.
- A 15 m height earth dam.

Question (2): [20]

a) Draw neat sketches for: (10)
- Wash borings.
- Standard split spoon sampler.
- Piston sampler.

b) Explain how you can determine the level of ground water table during subsurface investigation in cohesionless and cohesive soils. (5)

c) State laboratory tests that can be performed on disturbed and undisturbed soil samples. (5)

Question (3): [15]

a) Explain using sketches how Standard Penetration Test can be performed. (6)

b) A Standard Penetration Test was conducted in a fine sand stratum at a depth of 6.0 m. The blow counts obtained in the field were (8,12,15) blows. The ground water table is at the ground surface. The average saturated unit weight of the soil is 1.90 t/m^3. The test was conducted in a 15 cm diameter boring using a drill rod of length 6.50 m. Determine the corrected SPT blow counts. (9)

Question (4): [20]

a) List the field tests, which can be used for measuring the in-situ soil resistance. For what type of soils, each test will give reliable results? (4)

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

c) For the vane shear, derive an expression to obtain the shear strength of the tested soil in terms of the turning moment and the dimensions of the van. (10)

Question (5): [25]

a) Describe using sketches the procedure of conducting the Plate Load Test. And discuss the limitations of the test. (10)

b) State whether the following statements are true or false and correct the false statements: (6)

1) In a cohesive soil, the settlement of a 30 cm plate in a plate load test is 2.0 cm, and then the settlement of a square footing of 90 cm side under the same load intensity will be 4.0 cm.

2) In the plate load test, the load will be applied in the increments of 10% of the estimated ultimate load.

3) The minimum settlement that is to be observed for ending the plate load test is 20 mm.

c) Plate load tests with circular plates were conducted in the field and the following results were obtained (9)

Plate diameter (m)	load (ton)	Settlement (mm)
0.30	5.63	25
0.45	10.245	25
0.60	15.08	25

What size of square footing is required to carry a load of 120 ton at a settlement of 25 mm?

With my best wishes,
Dr.Ahmed Abdel-Galil