



Marks

Question (1):

[20]

- a) Discuss the various steps of subsurface exploration. (8)
- b) Describe using sketches the common methods for drilling borings. (12)

Question (2):

[20]

- a) Describe using sketches the common methods for sampling. (12)
- b) What is meant by undisturbed sample? Discuss the major problems associated with obtaining undisturbed soil samples in the field. (8)

Question (3):

[20]

- a) Explain and discuss the various factors that be considered in deciding the depth of borings required for subsoil exploration. (8)
- b) State various field and laboratory tests to evaluate strength and deformation properties of sandy soils. (6)
- c) What is the area ratio? State its significance. (6)

Question (4):

[20]

Describe using sketches how the following field tests could be performed:

- Standard Penetration Test.
- Hand- operated Cone Penetration Test.
- Plate Load Test.
- Van Shear Test.

Question (5):

[20]

- a) A vane of diameter 12mm and height 20mm is used to determine the shear strength of clayey soil and fails at maximum torque of 0.20 N.m. Determine the undrained shear strength of clay. (6)
- b) Discuss the limitations of plate load test. (6)
- c) How are the results of field plate load tests extrapolated for sand and clay? (Write the extrapolation for ultimate bearing capacity and settlement). (8)

With my best wishes,
Dr. Ahmed Abdel-Galil