

BUILDING STRUCTURES 6
SUBSTRUCTURE COMPONENT
EXAMINATION :JUNE 2000

Time : 1.5 hours.

ANSWER ALL FIVE (5) QUESTIONS. ALL QUESTIONS ARE OF EQUAL VALUE. NO REFERENCE MATERIAL PERMITTED.

Question 1

- (a) Why are the letters of “Geo” so important in the field of Geotechnical Engineering?
- (b) Explain the difference between a footing and a foundation.
- (c) List the features of natural soils that make each soil problem unique.
- (d) List the three phases that comprise any soil system.

Question 2

- (a) A crack appears in the wall of a house. Give reasons for possible causes of the crack.
- (b) Describe the various types of footings that could be used for a house constructed in Adelaide, with regard to floor type (ie. concrete or timber), house type, soil type and terrain.

Question 3

- (a) For a large building, outline when a shallow spread footing would be used, and where a piled footing would be required.
- (b) Give examples of types of spread and piled footings in common use, and their applications.

Question 4

- (a) Explain how a slope instability can occur, and what soil or environmental aspects affect the potential for instability.
- (b) Outline the meaning of the terms “active pressure”, “passive pressure” and “earth pressure at rest” in relation to retaining walls.

Question 5

- (a) Explain the shape of the dry density-moisture content relationship curve for a typical soil subjected to compaction.
- (b) Outline how the properties of a soil profile may be improved at shallow depths (say less than 300 mm depth), at moderate depths (say 1.5m depth) and at deep levels (say 10.0m depth).