53 (CE 403) GTEN

2018

GEOTECHNICAL ENGG.

Paper : CE 403

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

*Answer **all** questions.*

1. *(a)* Define the following : 5

   (i) Alluvial deposit

   (ii) Lacustrine deposit

   (iii) Marine deposit

   (iv) Aeolian deposit

   (v) Glacial deposit.

(b) Explain the following : 10

(i) Two-phase soil system

(ii) Three-phase soil system.

(c) Derive the following : 5

(i) $n = \frac{e}{1+e}$

(ii) $W_s = \frac{W}{1+w}$.

2. (a) Explain the following : 5×2=10

(i) Water content determination of soil using Oven Drying Method

(ii) Specific gravity determination of soil solids using Pycnometer.

(b) Explain the in-situ unit weight determination of soil using : 5×2=10

(i) Care Cutter method

(ii) Sand Replacement method.

3. (a) Explain the procedure to determine : 5×2=10

(i) Liquid limit

(ii) Plastic limit.

(b) Give the symbols for the following soils : 1×5=5

(i) Sand

(ii) Clay

(iii) Silt

(iv) Organic Soil

(v) Peat.

(c) On what factors does the soil compaction depends? 5

4. (a) Explain the following tests : 5×2=10

(i) Constant head test for determining permeability

(ii) Consolidometer test.

(b) What are the features of flownets? 5

(c) Derive the expression to determine primary consolidation settlement. 5

5. (a) What do you understand by the terms : 2×5=10

(i) Effective stress

(ii) Pore water pressure

(iii) Degree of Saturation

(iv) Coefficient of Consolidation

(v) Well-graded soil ?

(b) Explain the Compaction curve for clayey soil ? 5

(c) Give the difference between Compaction and Consolidation. 5