

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/
MANAGEMENT/COMMERCIAL PRACTICE — OCTOBER, 2018

GEOTECHNICAL ENGINEERING

[Time : 3 hours

(Maximum marks : 100)

PART — A

(Maximum marks : 10)

Marks

I Answer *all* questions in one or two sentences. Each question carries 2 marks.

1. Identify residual and transported soil.
2. Define plasticity index.
3. State Darcy's law.
4. List the two geophysical methods of soil exploration.
5. Describe proportioning of footings.

(5×2 = 10)

PART — B

(Maximum marks : 30)

II Answer any *five* of the following questions. Each question carries 6 marks.

1. Analyze soil as a three phase system.
2. Discuss the importance of effective stress in the engineering behavior of soil.
3. Explain the procedure for finding out coefficient of permeability by variable head permeability test.
4. Identify the objectives of soil investigation.
5. Explain general and local shear failure.
6. Prepare the plan of a rectangular combined footing and list the circumstances under which it is essential.
7. Compile the precautions to be taken to avoid tilts and shifts during well sinking.

(5×6 = 30)

PART — C

(Maximum marks : 60)

(Answer *one* full question from each unit. Each full question carries 15 marks.)

UNIT — I

III (a) Derive a relationship between voids ratio, water content, specific gravity and degree of saturation. 7

(b) Explain the corrections to be applied to hydrometer. 8

OR

IV (a) A soil specimen has a water content of 10% and a wet unit weight of 20 kN/m³. If the specific gravity of the solid is 2.7, determine the dry unit weight, voids ratio and degree of saturation. Take $\gamma_w = 10$ kN/m³. 8

(b) Explain the three Atterberg's limit. 7

UNIT — II

V (a) Explain the difference between seepage velocity and discharge velocity. 7

(b) Discuss the factors affecting compaction. 8

OR

VI (a) Define the terms free water, adsorbed water and capillary water. 6

(b) Plot the results of Standard Proctor Test in a graph and explain the features optimum moisture content, maximum dry density and zero air voids line. 9

UNIT — III

VII (a) Distinguish between disturbed and undisturbed soil samples. 6

(b) Describe the limitations of Plate Load Test. 9

OR

VIII (a) Explain the wash boring method of soil exploration. 8

(b) Describe the Split Spoon Sampler and its use. 7

UNIT — IV

IX (a) Compile the objectives of foundation. 6

(b) Explain the classification of piles. 9

OR

X (a) Distinguish between shallow and deep foundation. 6

(b) Describe the parts of well foundation. 9