

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/
COMMERCIAL PRACTICE, APRIL – 2024**
GEOTECHNICAL ENGINEERING

[Maximum Marks : 100]

[Time : 3 hours]

PART – A
(Maximum Marks : 10)

Marks

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

1. Define the term soil.
2. Write the functional relationship between dry density, bulk density and water content.
3. Define free water and held water.
4. Differentiate between disturbed sample and undisturbed sample.
5. Draw the elevation and plan of a typical combined footing. (5x2=10)

PART – B
(Maximum Marks : 30)

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

1. Explain three phase system of soil.
2. Explain (i) Well graded soil (ii) Uniformly graded soil (iii) Gap graded soil.
3. List the factors affecting permeability.
4. Plot compaction curve and explain OMC and maximum dry density.
5. Explain (i) General shear failure (ii) Local shear failure.
6. List the limitations of plate load test.
7. Explain pile erection methods.

(5x6=30)

PART – C

(Maximum Marks : 60)

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

UNIT – I

- III.** (a) A soil sample weighing 0.195 kN and volume 0.01 m³ is dried in oven. The dry weight found is 0.156 kN. Determine (i) Water content (ii) Bulk unit weight (iii) Dry unit weight (iv) Void ratio. Take specific gravity as 2.60 and unit weight of water as 10 kN/m³. (8)
- (b) Explain procedure to determine liquid limit of soil by Casagrande apparatus. (7)

OR

- IV.** (a) Explain the procedure to find field density of soil by core cutter method. (7)
- (b) Explain the three Atterberg's limits with suitable graph. (8)

UNIT – II

- V.** (a) Explain the falling head permeability test with suitable sketch. (7)
- (b) Explain various factors affecting compaction. (8)

OR

- VI.** (a) State and explain Darcy's law. (3)
- (b) Differentiate between discharge velocity and seepage velocity. (4)
- (c) Explain various field methods of compaction. (8)

UNIT –III

- VII.** (a) Explain geophysical methods of soil exploration. (8)
- (b) Explain standard penetration test. (7)

OR

- VIII.** (a) Explain plate load test with neat sketch. (9)
- (b) List the objectives of site exploration. (6)

UNIT – IV

- IX.** (a) Sketch the different kinds of shallow foundations. (8)
- (b) Explain the procedure for sinking of well. (7)

OR

- X.** (a) List the classification of pile foundations. (8)
- (b) Draw the cross section and mark the components of the well foundation. (7)
