

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/
MANAGEMENT/COMMERCIAL PRACTICE, NOVEMBER – 2023**

GEOTECHNICAL ENGINEERING

[Maximum Marks: **100**]

[Time: **3 Hours**]

PART-A

[Maximum Marks: **10**]

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

1. Define voids ratio and porosity.
2. List the different types of corrections used in hydrometer method.
3. Define permeability of soil.
4. State four boring methods used for site exploration.
5. State the classifications of piles according to the materials used. (5 x 2 = 10)

PART-B

[Maximum Marks: **30**]

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

1. Explain consistency limits of soil.
2. List six objectives of compaction of soil.
3. Explain the classification of soil water.
4. Explain different types of soil samples.
5. List six guide lines for selecting the number and position of pits and boring for soil exploration.
6. Mention any six objectives of foundation.
7. Sketch different shapes of well foundation. (5 x 6 = 30)

PART-C

[Maximum Marks: **60**]

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

UNIT – I

- III. a. Establish a relationship between e, s, w and G (void ratio, degree of saturation, water content and specific gravity). (8)
- b. Explain the procedure for determining specific gravity of soil by using pycnometer. (7)

OR

- IV. a. Explain the method of determination of field density of soil by Core cutter method. (7)
- b. A sample of wet soil has a volume of 0.0195 m^3 and a weight of 320N. When the sample is dried out in an oven its weight is reduced to 285N. Determine its bulk unit weight, water content, dry unit weight, void ratio, porosity and degree of saturation. Take $G=2.65$. (8)

UNIT – II

- V. a. List the factors affecting permeability of soil. Explain any one. (7)
- b. Determine the value of OMC and maximum dry density from the compaction curve for a sample of soil whose compaction test observations are given below. The volume of sample is 0.95lit. (8)

Water content	0.10	0.12	0.14	0.16	0.18	0.2
Mass of wet soil(Kg)	1.66	1.75	1.92	1.95	1.84	1.79

OR

- VI. a. Explain four factors that affecting compaction of soil. (8)
- b. A soil sample 10cm high was tested in a permeameter. The initial head of water in the burets was found to be 50cm and drops 30cm in 20minutes. Determine the coefficient of permeability, if the diameter of stand pipe is 0.1 times that of soil sample. By falling head permeameter method. (7)

UNIT- III

- VII. a. Explain plate load test for determining bearing capacity of soil with a neat sketch. (8)
- b. List seven objectives of site exploration. (7)

OR

- VIII. a. Explain general and local shear failure. (7)
- b. Explain electrical resistivity method. (8)

UNIT - IV

- IX. a. Explain procedure for designing a strip footing using Rankin's analysis. (8)
b. Explain the classification of pile foundation according to mode of transfer of load. (7)

OR

- X. a. Explain any four methods used for tilt correction of well foundation. (6)
b. Explain the component parts of a well foundation with a neat sketch. (9)
