

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/
MANAGEMENT/COMMERCIAL PRACTICE, APRIL-2020

GEOTECHNICAL ENGINEERING

[Maximum marks: 75]

(Time: 2.15 Hours)

PART – A

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

- I. (1). Define water content of soil.
(2). Define the term voids ratio of soil.
(3). What is meant by permeability of soil.
(4). Define ultimate bearing capacity of soil.
(5). Define the term foundation of a structure. (3 x 2 = 6)

PART – B

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

- II. (1). Explain three phase system of soil with block diagram.
(2). List the factors affecting the permeability of soil.
(3). List the factors affecting compaction of soil.
(4). Distinguish general and local shear failure of soil under foundation.
(5). List the objectives of soil investigation.
(6). Distinguish shallow and deep foundation.
(7). List the objectives of foundation of a structure. (4 x 6= 24)

PART – C

(Answer **any of the three units** from the following. Each question carries 15 marks)

UNIT –I

- III. (a). A soil sample has a porosity of 37% and specific gravity of soil solids is 2.65. Find voids ratio, unit weight of soil when it is fully dry, when 50% saturated and 100% saturated with porosity remains unchanged. (8)
(b). Explain the procedure to find water content of soil using oven drying method. (7)

OR

- IV. (a). A soil has a bulk unit weight of 20.11 KN/m^3 and a water content of 15%. Calculate water content if soil partially dries to a unit weight of 19.42 if voids ratio is unchanged. Find voids ratio if specific gravity of soil solids is 2.65 . (6)
- (b). Explain the procedure to find specific gravity of soil solids using pycnometer. (9)

UNIT-II

- V. (a). Explain the procedure to find permeability of soil using constant head permeameter with the help of a neat sketch. (9)
- (b). Explain different type of soil water. (6)

OR

- VI. (a). Explain the procedure for standard proctor test. (9)
- (b). Explain any four soil compacting equipments. (6)

UNIT-III

- VII. (a). With sketches explain different types of combined footings. (6)
- (b). Explain the procedure for standard penetration test. (9)

OR

- VIII. (a). Explain the disadvantages of seismic method of soil exploration. (6)
- (b). Explain the procedure of electrical resistivity method of soil exploration. (9)

UNIT-IV

- IX. (a). With neat sketch explain mat foundation. (6)
- (b). Explain the classification of pile foundation. (9)

OR

- X. (a). Draw the section and mark the components of a well foundation. (6)
- (b). Describe the rectification for tilt and shift of well foundation with sketch. (9)