TED (10)–4006 Reg. No. .....

(REVISION—2010) Signature .....

FIFTH SEMESTER DIPLOMA EXAMINATION IN ENGINEERING/ TECHNOLOGY—OCTOBER, 2012

GEOTECHNICAL ENGINEERING

(Common for CE, EV, WR and QS)

[*Time* : 3 hours

(Maximum marks : 100)

Marks

PART—A

(Maximum marks : 10)

I Answer the following questions in one or two sentences. Each question carries 2 marks.

1. Define the term porosity of soil.
2. State Darcy's law of laminar flow of water through homogeneous soil body.
3. Differentiate ultimate and safe bearing capacities of soil.
4. Define foundation of a structure.
5. Define the influence zone for foundation. (5×2=10)

PART—B

(Maximum marks : 30)

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

1. Establish the relationship between porosity and void ratio with the help of a 3 phase diagram.
2. What are the corrections applied for hydrometer readings and mention under what situations they are applied ?
3. Explain compaction curve and its applications.
4. List down the factors affecting permeability.
5. Give procedure for soil profiling using electrical resistivity method.
6. Mention the guidelines for selecting the depth of foundation.
7. Explain any four types of shallow foundations with their suitability for site conditions. (5×6=30)

Marks

PART—C

(Maximum marks : 60)

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

UNIT—I

III (a) A sample of undisturbed clay has a volume of 20 ml. and mass of 30 gm. After oven drying the mass reduced to 18 gm. Find its moisture content, void ratio and dry density assuming specific gravity of soil solids as 2.2. 5

(b) Compare the shapes of gradation curves for well graded, uniformly graded, gap graded, fine graded and coarse graded soils. 5

(c) Explain the procedure for finding field density of soil using core cutter method. 5

OR

IV (a) Define the terms :

(i) Field density (iii) Specific gravity

(ii) Dry density (iv) Degree of saturation 5

(b) Demarcate the various consistency limits of soil on a volume-moisture curve with different states of existence of soil. 5

(c) Explain the procedure to find liquid limit of soil. 5

UNIT—II

V (a) Compare standard and modified Proctor tests. 5

(b) List down the factors affecting compaction of soil. 5

(c) Under what conditions compaction is necessary for soils in construction sites ? 5

OR

VI (a) Give the theory of finding coefficient of permeability of soil using constant head method. 5

(b) What are the methods used in field for compacting the soil ? 5

(c) Distinguish discharge velocity and seepage velocity. 5

UNIT—III

VII (a) What are the objectives of soil investigation ? 5

(b) Distinguish between the uses of disturbed and undisturbed soil samples. 5

(c) Explain the procedure of plate load test for bearing capacity of soil. 5

OR

Marks

VIII (a) Write down the steps involved in conducting standard penetration test. 5

(b) What are the limitations of geophysical investigation methods ? 5

(c) List down the various methods for soil exploration. 5

UNIT—IV

IX (a) What are the objectives of providing foundation for structures ? 5

(b) Design the width of a strip footing for a load bearing wall structure subjected to a total uniform load intensity of 60 KN/m founded on soil with safe bearing capacity 80 KN/m^2. 5

(c) Explain any two methods for the rectification of tilt of well foundation. 5

OR

X (a) Under what conditions a combined footing is advisable for a set of columns ? 5

(b) Give the detailed classification of piles with the help of sketches. 10