

TED (10)–4006

(REVISION–2010)

Reg. No.

Signature

FIFTH SEMESTER DIPLOMA EXAMINATION IN ENGINEERING/
TECHNOLOGY—MARCH, 2013

GEO TECHNICAL ENGINEERING

(Common to CE, EV, WR & QS)

[Time : 3 hours

(Maximum marks : 100)

Marks

PART—A

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

1. Define the term water content.

2. State Darcy's Law.

3. Distinguish between drift and shaft.

4. What is a friction pile ?

5. Define consistency limits.

(5x2=10)

PART—B

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

1. What is a transported soil ? Explain transported soil by wind and water.

2. A soil sample has porosity of 40%. The specific gravity of solid is 2.65. Calculate: (a) Void ratio (b) Dry density and (c) Unit weight if the saturation is 50%.

3. Explain any six factors that affect permeability of soil.

4. Explain any four factors that affect compaction of soil.

5. List different types of boring for soil exploration. Explain any one briefly.

6. Give procedure for soil profiling using electrical resistivity method.

7. Determine the size of a square shallow footing for a column carrying a dead load of 150 KN and live load of 120 KN. The ultimate bearing capacity of soil is 330 KN/m².

(5x6=30)

PART—C

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

UNIT – I

- III (a) Give the procedure (with figure) for sand replacement method to determine the in-situ density of soil. 8
- (b) Establish a relation between e , s , w and G . (Void ratio, degree of saturation, water content and specific gravity) 7

OR

- IV (a) Define grading of soil. Draw particle distribution curve for different soil and explain. 8
- (b) A moist sample of soil mass of 633g has a volume of 300 cm^3 at a water content of 11%. Determine e , s and n_a , take $G = 2.68$. 7

UNIT – II

- V (a) Explain with figure constant head permeability test to determine co-efficient of permeability. 8
- (b) The following observations are made in a standard proctor test :

Trial No.	1	2	3	4	5	6
Mass of wet soil	1.70	1.89	2.03	1.99	1.96	1.92
Water content	7.70	11.50	14.60	17.50	19.70	21.20

Volume of mould = 945 CC, $G = 2.67$. Determine the maximum dry density and optimum moisture content. 7

OR

- VI (a) Explain briefly free water, structural water, pore pressure and effective pressure. 8
- (b) Explain briefly the factors affecting permeability of soil. 7

UNIT – III

- VII (a) Explain plate load test to determine the bearing capacity of soil. 8
- (b) What are the objective of site exploration ? 7

OR

- VIII (a) Explain standard penetration test. What is the importance of this test in Geo technical Engineering ? 8
- (b) Define the following :
- (i) Ultimate bearing capacity.
 - (ii) Safe bearing capacity.
 - (iii) Allowable bearing pressure.
 - (iv) Disturbed soil sample; and
 - (v) Undisturbed soil sample. 7

UNIT – IV

- IX (a) List any four common shape of well foundation. Explain the component of a well foundation with a neat sketch. 8
- (b) Explain the causes of failure of foundation. 7

OR

- X (a) What is a bearing pile ? Explain necessity of pile foundation. 8
- (b) Recommend suitable type of foundation for the following situations :
- (i) Hard soil is available at low depth.
 - (ii) Marshy land with faty clay.
 - (iii) For black cotton soil.
 - (iv) The strata just below the ground is soft and hard strata available at reasonable depth.
 - (v) Heavy column load and hard strata of soil is not available at considerable depth.
 - (vi) Foundation for bridge piers.
 - (vii) For column adjacent to boundary. 7

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