

FIFTH SEMESTER DIPLOMA EXAMINATION IN ENGINEERING/
TECHNOLOGY — MARCH, 2015

GEOTECHNICAL ENGINEERING

(Common to 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. Differentiate between saturated unit weight and submerged unit weight.
2. Define the following :
 - (i) Plasticity index
 - (ii) Liquidity index.
3. State any two primary objectives of soil exploration.
4. What are the classifications of piles based on mode of transfer of loads ?
5. What are the different types of shallow foundations ? (5×2=10)

PART—B

(Maximum marks : 30)

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

1. What are the applications of soil engineering in civil engineering construction ?
2. Describe formation of soil.
3. State various corrections required for a hydrometer reading. How these corrections are determined ?
4. Write any three objectives of compaction of soil.
5. What do you understand by site investigation ? What is the different purpose for which site investigation is done ?
6. Draw the neat sketch showing the component parts of a well foundation.
7. Distinguish between disturbed and undisturbed soil samples. (5×6=30)

PART—C

(Maximum marks : 60)

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

UNIT—I

- III (a) Derive the functional relationship between e , g , w and s . 8
- (b) A soil sample has unit weight 20.11KN/M^3 and water content of 15 percentages. Calculate the water content. If the soil partially dries to a unit weight of 19.42KN/M^3 and the void ratio remains unchanged. 7

OR

- IV (a) Derive the relation between dry unit weight (γ_d), unit weight (γ), and water content (w). 8
- (b) The total unit weight of soil sample is 16KN/M^3 . The specific gravity of soil particle is 2.67. The water content of the soil 17 percentage. Calculate dry unit weight, porosity, void ratio and degree of saturation. 7

UNIT—II

- V (a) Explain with neat sketch calibration of hydrometer. 8
- (b) Explain the experimental procedure for determination of water content by oven drying method. 7

OR

- VI (a) Explain with neat sketch determination of field density of soil by sand replacement method. 8
- (b) How is specific gravity of soil determined using pycnometer ? 7

UNIT—III

- VII (a) Describe the following terms : 8
- (i) Adsorbed water (iii) Structural water
- (ii) Pore water (iv) Capillary water.
- (b) List any six factors affecting permeability. 7

OR

- VIII (a) Explain with neat sketch determination of permeability test. (constant head) 8
- (b) State Darcy's law and what are the limitations ? 7

UNIT—IV

- IX (a) Explain with sketch plate load test. (gravity loading) 8
- (b) What are the precautions must be taken to avoid tilts and shifts during well sinking. 7

OR

- X (a) What are the limitations of plate load test ? 7
- (b) Explain with sketch raft foundation. 8