BCE-046

DIPLOMA IN CIVIL ENGINEERING
DCLE(G)
Term-End Examination

00094 **June, 2017**

BCE-046 : SOIL MECHANICS AND FOUNDATION ENGINEERING

Time : 2 hours   *Maximum Marks : 70*

Note : *Question no. 1 is compulsory. Attempt any four questions from the remaining five questions.*

1. Fill in the blanks from the given options : *7×2=14*

   (a) When the soil just begins to crumble when rolled into 3 mm thread diameter it is known as _____ limit. (plastic/liquid/elastic)

   (b) The freezing of water is accompanied by a volume increase of _____ . (10%/12%/15%/19%)

   (c) Partially saturated soil is classified as _____ phase soil. (one/two/three)

   (d) A foundation is called shallow when depth (D) is _____ width (B).
   (less than/equal to/2B/4B)

   (e) The phenomenon of quicksand takes place in _____ soil. (sandy/clayey/black cotton)

(f) The shearing strength of cohesionless soil depends on _____ . (confining pressure/loading pressure/dry density)

(g) Consolidated Drained Test is also known as _____ . (quick test/slow test/rapid test)

2. (a) Write the salient features of Mohr-Coulomb failure theory.

(b) The bulk density of a soil sample is 20 kN/m³. Its specific gravity (G) is 2·70 and water content is 12%. Calculate dry unit weight, voids ratio, porosity and degree of saturation. Assume γ_ω = 10 kN/m³. $2\times7=14$

3. (a) Explain the Standard Proctor Compaction Test.

(b) At a given place 10 m below ground surface, determine the total, neutral and effective stresses when the water table is 3 m below, unit weight of water is 10 kN/m³, unit weight of soil above the water table is 20 kN/m³ and saturated unit weight of soil below the water table is 22 kN/m³. $2\times7=14$

4. (a) Explain the method of construction of Newmark's Influence Chart.

(b) Describe the effect of type of soil on ultimate bearing capacity of soil for various types of footing. $2\times7=14$

5. (a) Explain the Triaxial Test in detail.

    (b) Explain the Coulomb's shear strength equation. What are the limitations of Coulomb's theory ? $\quad 2 \times 7 = 14$

6. Write short notes on any **four** of the following : $\quad 4 \times 3\frac{1}{2} = 14$

    (a) Darcy's Law

    (b) Primary and Secondary Settlement

    (c) Flow Net Diagram

    (d) Types of Soils

    (e) Laplace's Equation

    (f) Effective Stress

———————