Code: CE4T2

II B.Tech - II Semester – Regular Examinations – May 2016

GEOTECHNICAL ENGINEERING-I
(CIVIL ENGINEERING)

Duration: 3 hours   Max. Marks: 70

PART – A

Answer *all* the questions.   All questions carry equal marks

11x 2 = 22 M

1.
   a) Define Void Ratio.
   b) Draw the phase diagram.
   c) Define liquid limit.
   d) What is the IS classification symbol for the soil having Sand =91%; Silt = 9%?
   e) What are the factors that affect the permeability of a soil mass?
   f) Define Seepage velocity.
   g) What is Unconsolidated- Undrained condition?
   h) Give the Coulomb's shear strength equation.
   i) What are the reasons for compression of the soil?
   j) What is immediate settlement?
   k) Write a note on piping.

PART – B

Answer any ***THREE*** questions.   All questions carry equal marks.

$$3 \times 16 = 48 \text{ M}$$

2.

a) Define void ratio, porosity, degree of saturation, water content in a soil mass.   8 M

b) Calculate the void ratio, porosity and degree of saturation of a soil sample, if it has the wet density 2.0 g/cc and dry density 1.8 g/cc. Specific gravity of soil is 2.7.   8 M

3.

a) Describe the I.S. Classification of the fine grained soils.
                                             8 M

b) Derive the relationship to determine the coefficient of permeability using variable head test and state its suitability.   8 M

4.

a) What is flow net? State its properties and applications. What is the quality of seepage between two successive flow lines and equi-potential lines?   8 M

b) A 25 kN point load act on the surface of the horizontal ground. Find the intensity of vertical pressure at 6m directly below the load. Use Boussinesq's equation.
                                             8 M

5.

  a) Define compaction of soils and list out the various factors that influence the compaction of soils.   8 M

  b) Explain square root time method to determine coefficient of consolidation.   8 M

6.

  a) Explain the basic differences between a box shear test and triaxial test for soils.   8 M

  b) A direct shear test was performed on a dry sandy soil. Normal and shear stress at failure are given below. Determine shear parameters of sand.   8 M

Normal stress (kN/m^2)	50	100	200
Shear stress (kN/m^2)	35	80	150