201003

Seat No.	

S.E. (Cilvil) (Semester – I) Examination, 2014
GEOTECHNICAL ENGINEERING
(2012 Course)

Time : 2 Hours Max. Marks : 50

Instructions : *1) Answer Q.1 or Q. 2, Q. 3 or Q. 4, Q. 5 or Q. 6 and Q. 7 or Q. 8.*
*2) Figures to the **right** indicate **full** marks.*
*3) Use of electronics pocket calculator is **allowed**.*
*4) **Assume** suitable data if necessary.*
*5) Neat diagrams must be drawn **wherever** necessary.*

1. a) Discuss the various types of soil deposits in India with their significant soil property. 4
   b) Derive the equation w. G = e. S_r. 4
   c) The total unit weight of a soil sample is 18.5kN/m^2. Calculate the Dry unit weight, porosity, void ratio, degree of saturation if the same soil sample has water content 17% and specific gravity 2.65. 4

OR

2. a) State Darcy's Law. Discuss the validity of Darcy's Law for flow of water through soils. 4
   b) With help of neat sketch explain the quick sand phenomenon. 4
   c) In a falling head permeability test on a silty-clay sample, the following results were obtained : sample length 120 mm, sample diameter 80 mm, initial head = 1150 mm, final head = 420 mm, time for fall in head = 8 minutes, stand pipe diameter being 10 mm. Find the coefficient of permeability of the soil. 4

3. a) What is compaction ? How it is differ from consolidation ? Explain how compacting effort affects compaction ? 6
   b) Explain the term pressure bulb and its significance. 6

OR

4. a) Explain the principle of the direct shear test. What are the advantages of this test ? What are its limitations ? 4
   b) A Triaxial test was conducted on sand specimen and the sample failed at a deviator stress of 480 kN/m^2, when the cell pressure was 100 kN/m^2 under drained condition. Find the effective angle of shearing resistance of sand. 4
   c) Write a short note on Sensitivity of soil. 4

P.T.O.

5. a) State the assumptions made in Rankine's earth pressure theory and distinguish between 'active' and 'passive' earth pressure. 7

   b) A retaining wall 10 m high retains a cohesionless soil having $\phi = 30°$. The surface of the soil is level with the top of the wall. The top 3 m of the fill has a unit weight 18 kN/m^3 and that of the rest is 20 kN/m^3. Determine magnitude and point of application of active pressure per 'm' length of wall. The value of ϕ same for both the soil layers. 6

OR

6. a) Explain Coulomb's wedge theory. 7

   b) Write a note on Cullman's graphical method. 6

7. a) Explain with figure, the modes of failure for finite and infinite slopes. 7

   b) Write a note on impact of contamination on Geoenvironment. 6

OR

8. a) What are the effects of sub surface contamination ? Enlist the remedial measures to control the same. 7

   b) Write a note on Taylor's stability number. 6