Code: CE6T6

III B.Tech - II Semester – Regular Examinations – May 2015

GEOTECHNICAL ENGINEERING - II
(CIVIL ENGINEERING)

Duration: 3 hours   Marks: 5x14=70

Answer any FIVE questions.   All questions carry equal marks

1. a) Discuss in detail about the stages involved in preparation of a soil investigation report.   7 M

   b) The Field 'N' value in a deposit of fully submerged fine sand was 50 at a depth of 8m. The average Saturated unit weight of soil is 19 kN/m^3. Calculate the corrected 'N' value.   7 M

2. a) Explain Bishop's simplified method. Derive an expression for the factor of safety.   7 M

   b) An infinite slope is made of clay with the following properties:
   $\gamma = 18$ kN/m^3 , $\gamma' = 9$ kN/m^3 , $c' = 25$ kN/m^2 , $\phi = 28°$.
   If the slope has an inclination of 40° and height is 15m, determine the stability of slope, when
   i) Slope is submerged, &
   ii) There is seepage parallel to the slope.   7 M

3. a) Discuss Coulomb's method for determination of active earth pressure. Compare Rankine's theory with Coulomb's theory.

7 M

b) Determine the Active pressure by Rankine's theory per unit run for a retaining wall of 6m high, with $\phi = 30°$, i = 15°, and $\gamma = 19$ kN/m^3. The back face of the wall is smooth and vertical.

7 M

4. a) Define Retaining wall. List out its types. Explain in detail about cantilever retaining wall.

7 M

b) Discuss about the stability of a Gravity Retaining wall. 7 M

5. a) Write in detail about Meyerhof's bearing capacity theory. How is it different from Terzaghi's theory?

7 M

b) A strip footing of 2m width is founded at 3m below the ground surface. Determine the net ultimate Bearing capacity, using (i) Terzaghi's equation, (ii) Skempton's equation , (iii) Is code. The soil is Clay (ϕ=0, c=10 kN/m^2). The unit weight of the soil is 20 kN/m^3. (N_c=5.7, N_q=1.0, N_γ= 0).

7 M

6. a) Illustrate the method to estimate the immediate settlements of a foundation on cohessionless soils.

7 M

b) Explain the method to determine the safe bearing capacity from Plate load test. 7 M

7. a) Discuss the uses of penetration tests for the estimation of load carrying capacity of piles. 7 M

b) A 300mm diameter and 10m long piles are used as foundations for a column in a uniform deposit of a medium clay ($q_u = 100$ kN/m^2). The spacing between the piles is 500mm. There are 9 piles in a group arranged in a square pattern. Calculate the ultimate pile load capacity of the group. Assume adhesion factor = 0.9. 7 M

8. a) Explain the procedure for construction of wells. Discuss the causes and remedies for tilts and Shifts. 7 M

b) Illustrate various methods for the design of well foundations and state their relative merits. 7 M