K-133

Seat No.	

Total No. of Pages :3

T.E. (Civil)-II (Semester-VI) Examination, 2013
GEOTECHNICAL ENGINEERING-II (Revised)
Sub. Code : 45543

Day and Date : Monday 13 - 05- 2013 **Total Marks : 100**

Time :2.30 p.m. to 5.30 p.m.

Instructions : 1) Question No.1 from Section-I and Question No.5 from Section-II are compulsory. Attempt any two questions from the remaining in each section.

2) Figures to the right indicate full marks.

3) Make assumptions wherever necessary.

4) Use of non-programmable calculator is allowed.

SECTION-I

Q1) All questions are compulsory: **[4 x 5 = 20]**

a) Explain the Rotary drilling.

b) Differentiate between finite and infinite slope.

c) How do you consider local shear effect in bearing capacity equation?

d) What are the different types of settlements of footings?

Q2) a) Discuss Friction circle method. **[5]**

b) A new canal is excavated to a depth of 5m below ground level, through a soil having the characteristics: c =14 kN/m^2 ; φ = 15°; e = 0.8; and G=2.7. The slope of bank is 1 in 1. Calculate the factor of safety w.r.t. cohesion when the canal suddenly and completely emptied. Take Sn = 0.083 for φ = 15°, and Sn = 0.122 for φ = 7.3° **[6]**

c) Explain the following terms:- **[4]**
Representative and Non representative samples.

Q3) a) Discuss the factors influencing bearing capacity of soil. **[5]**

P.T.O.

b) Using Terzaghi's theory determine the ultimate bearing capacity of a strip footing 1.5m wide resting on a saturated clay (Cu = 30 kN/m^3; φ_u = 0 and γ_{sat} =20 kN/m^3), at a depth of 2 m below ground level. The water table is also at a depth of 2 m below ground level. If the water table rises by 1 m, calculate the percentage reduction in the ultimate bearing capacity. For $\varphi = \varphi_u = 0^o$; Nc = 5.7, Nq = 1.0, Nr = 0 **[10]**

Q4) Write notes on (any three): **[15]**

a) Describe the advantages of open excavation.

b) Causes of slope failure.

c) Pressuremeter test.

d) List the factors influencing settlement.

SECTION-II

Q5) All questions are compulsory:- **[4 x 5=20]**

a) When there is need of combined footing? Explain.

b) What is group efficiency of pile group? Explain feld's rule.

c) Draw the cross section of well foundation and name the different parts.

d) Explain Vibroflotation.

Q6) a) Explain the various factors to be considered in deciding the location and depth of shallow foundation. **[6]**

b) A trapezoidal footing is to be produced to support two square column of 30 cm and 50 cm sides respectively. Columns are 6 meters apart and the SBC of the soil is 400 kN/m^2. The bigger column carries 5000 kN and smaller carries 3000 kN load. Design a suitable size of the footing so that it does not extend beyond the faces of the columns. **[9]**

Q7) a) Write a note on Negative skin friction. **[6]**

b) 200 mm diameter, 8m long piles are used as foundation for a column in a uniform deposit of medium clay (unconfined compression strength = 100 kN/m^2 and adhesion factor = 0.9). There are nine piles arranged in a square pattern of 3 X 3. For a group efficiency = 1.0, find the spacing between the piles (neglect bearing). **[9]**

Q8) a) What are the advantages and disadvantages of caisson foundation over piles? **[6]**

b) Write note on under reamed pile. **[5]**

c) Name the techniques used in ground improvement. **[4]**

❄❄❄❄