

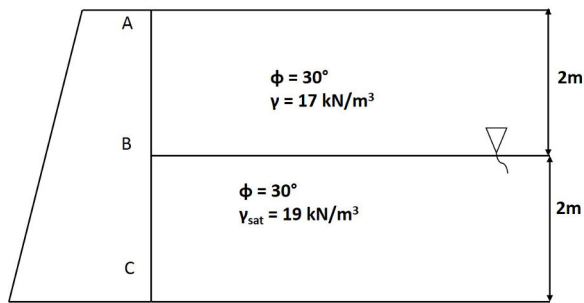
End Semester Examinations - 2015-16 Even Semester - May 2016

14CE2012 Foundation Engineering

Set A

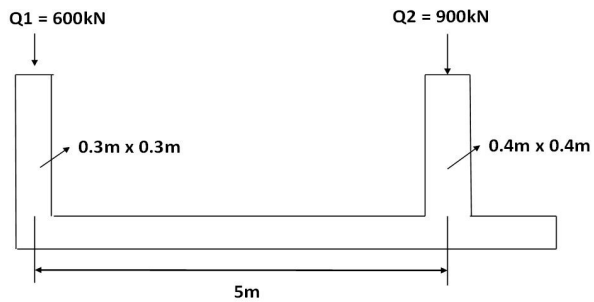
Time : 3 hrs
Total Marks: 100

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1. a) How would you decide the depth of exploration and the lateral extent of the soil investigations? (10)
b) Discuss standard penetration test. What are the various corrections? What is the importance of the test in geotechnical engineering? (10)
- OR**
2. a) Outline the various methods of drilling holes for subsurface investigations with neat sketches. (10)
b) Briefly explain about the cone penetration test with neat sketch? How these tests differ from standard penetration test? (10)
3. a) Briefly explain about the geophysical methods of investigation with neat sketches (15)
i. Seismic method ii. Electrical resistivity method
b) Describe the salient features of a good sub-soil investigation report. (5)
- OR**
4. a) Briefly explain about the cone penetration test with neat sketch? How these tests differ from standard penetration test? (10)
b) Discuss various types of soil samplers for obtaining the disturbed and undisturbed samples. What are the factors that affect the sample disturbance? (10)
5. a) Derive the equation to find the bearing capacity of soil for strip footing by Terzaghi's theory under general shear failure? Write the assumptions made in it? (10)
b) Determine the net ultimate bearing capacity of the strip footing has 1.5m wide and 1.0m depth for the following cases. (10)
i. Water table is at the level of the base of footing
ii. Water table rises to the ground surface
iii. Water table rises to the 0.5m above the base of footing.
iv. Water table is 1m below the base of footing.
- OR**
6. a) Describe plate load test. What are its limitations and used? (8)
b) Calculate the safe bearing capacity for a square footing has width 1.5m and depth 1.5m from the SPT test N value is 28 at a depth of 1.5m. Take the unit weight of soil is 20kN/m^3 and Cohesion $C = 15\text{kN/m}^2$. (6)
c) Determine the allowable gross load and net allowable load for a square footing of 2m side and with a depth of foundation 1m. Use Terzaghi's theory and assume local shear failure. Take a factor of safety of 3. The soil at the site has angle of internal friction $= 25^\circ$, unit weight of soil $= 18\text{kN/m}^3$ and cohesion $= 15\text{kN/m}^2$. (6)
7. a) Discuss in detail about to determine the active earth pressure with neat sketches by
i. Rehmann's method (5)
ii. Culmann's method (5)
b) Determine the lateral earth pressure at rest per unit length of the wall shown in figure given below. Determine the location of the resultant earth pressure. Take $K_0 = 1 - \sin\phi$, $\gamma_w = 10\text{kN/m}^3$. (10)



OR

8.
 - a) Derive the expressions for Rankine's active and passive earth pressure for cohesive soil with the help of pressure distribution diagram? (15)
 - b) Define Coulomb's wedge theory. What are the three forces acting in the sliding wedge? (5)
9.
 - a) Design a rectangular combined footing for two columns shown in fig. Take allowable soil pressure as 100 kN/m^2 and Width of the footing is 2.4 m . (12)



- b) Discuss the procedure for proportioning of footings for equal settlement. (8)

Wishing you All the Best
