

Student Exam No:

GANPAT UNIVERSITY
B.TECH SEM VI CIVIL ENGINEERING
REGULAR EXAMINATION MAY- 2014
2CI603 GEOTECHNICAL ENGINEERING - II

Time: 3 Hours

Max Marks: 70

- Instructions:** - (1) Answer to the two sections must be written in separate answer books.
(2) Figures to the right indicate full marks.
(3) Assume suitable data if required.

SECTION - I

- Q1(A)** Describe the pile load test with neat sketch. (6)
(B) Describe the IS code method for determining the bearing capacity of soil. (6)

OR

- Q1(A)** How would you estimate the group capacity of piles in (a) sand (b) clay? (6)
(B) Discuss the effect of water table on the bearing capacity of the soil. (6)

- Q2(A)** What is negative skin friction? What is its effect on the pile? (6)
(B) Write the factors affecting the bearing capacity of the soil. (5)

OR

- Q2(A)** Classify piles on the basis of function and method of installation. Briefly explain them also. (6)
(B) Differentiate between the general shear failure and local shear failure. How the ultimate bearing capacity in local shear failure is determined? (5)

- Q3(A)** A square footing 2.5m by 2.5m is built in a homogenous bed of sand of having unit weight as 20 kN/m^3 and having an angle of internal friction of 36° . The depth of the base of the footing is 1.5m below the ground surface. Calculate the safe load that can be carried by a footing with a factor of safety of 3 against complete general shear failure. Use Terzaghi's analysis. Take $N_c = 65.4$, $N_q = 49.4$, $N_\gamma = 54$. (6)

- (B) A square group of 25 piles extends between depth of 2m and 12m in a deposit of 20m thick stiff clay overlaying rock. The piles are 0.5m in diameter and the spaced at 1m centre to centre in the group. The undrain shear strength of clay at the pile based level is 189 kPa and the average value of the undrained shear strength over the depth of the pile is 110 kPa. The adhesion coefficient is 0.45. Estimate the capacity of the pile group considering an overall factor of safety equal to 3 against the shear failure. N_c corresponding to $\phi_u=0$ is 9. (6)

SECTION – II

Q4(A) Describe split spoon samplers. What is its use? (6)

(B) What is collapsible soil? How you can identify the collapsible soil? (6)

OR

Q4(A) Discuss standard penetration test. What are the various corrections? (6)
What is the importance of the test in geotechnical engineering?

(B) What is the under reamed pile? What are its design criteria? How would you install it? (6)

Q5(A) Describe in brief various geophysical methods. (6)

(B) What are the effects of swelling on buildings? (5)

OR

Q5(A) Describe in detail the types of soil samplers with sketches. What are their uses? (6)

(B) Explain the factors affecting the selection of type of foundation. (5)

Q6(A) What are the various methods of modification of an expansive soil to improve its characteristics? (4)

(B) Write detail notes on Liquefaction. (4)

(C) Write detail note on Earthquake. (4)

END OF PAPER