Student Exam No:

# GANPAT UNIVERSITY
## B.TECH SEM VI CIVIL ENGINEERING
## REGULAR EXAMINATION April - June 2015
## 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) Differentiate between Disturbed and Undisturbed Samples. (3)

(B) What are the common causes of moisture change in soils? (4)

(C) Define Liquefaction. What are the factors affecting Liquefaction. (5)

OR

Q1(A) A SPT test was performed at a depth of 12m in a dense sand deposit with a unit weight of 17.5 $kN/m^3$. If the observed N – value is 30, what is the corrected N – value for overburden? (3)

(B) Define the parameters : (1) Free swell (2) Unrestrained free swell (3) Differential swell (4) Swelling pressure (4)

(C) What do you mean by Geosynthetics? What are its types? Also give uses of geotextiles. (5)

Q2(A) Write a short note on Drilled Piers. (6)

(B) Write a short note on Prevention of Liquefaction. (5)

OR

Q2(A) Describe the method of replacement of the expansive soil with a good quality soil. How would you construct a footing using this method? (6)

(B) Write a short note on Earthquake. (5)

Q3(A) Describe standard penetration test. (4)

(B) Describe stationary piston samplers. (4)

(C) Write a short note on Seismic Refraction method. (4)

## SECTION – II

Q4(A) Describe plate load test. What are its limitation and uses? (6)

(B) A wooden pile is being driven with a drop hammer weighing 20kN and having a free fall of 1m. The penetration in the last blow is 5mm. Determine the load carrying capacity of the pile foundation according to the Engineering News formula. (6)

OR

Q4(A) Define the following term: (6)

(i)Bearing capacity (ii)Gross pressure intensity (iii)Net pressure intensity (iv)Ultimate bearing capacity (v)Net ultimate bearing capacity (vi)Net safe bearing capacity

(B) A square pile of section 50 x50 cm and 10m long penetrates a deposit of clay with c= 40KN/$m^2$. Taking m = 0.7, determine the load carried by the pile by skin friction. (6)

Q5(A) Discuss various dynamic formulae. What are their limitations? (6)

(B) Explain the types of shallow foundation in detail. (5)

OR

Q5(A) Classify piles on the basis of function, material & composition and method of installation. Briefly explain them also. (6)

(B) Write down the different steps for selection of type of foundation. (5)

Q6(A) A footing 3m square carries a gross pressure of 350kN/m$^2$ at a depth of 1.2 m in sand. A saturated unit weight of sand is 20kN/m$^3$ and the unit weight above the water table is 17kN/m$^3$. The shear strength parameters are c= 0 and ø=30°, Nq = 22, and Nγ = 20. Determine the factor of safety with respect to shear failure for the following cases: **(6)**

(a) Water table is at 5m below the ground level.

(b) Water table is at 1.2 m below the ground level.

(B) A square footing has dimensions of 2m X 2m and a depth of 2m. Determine the ultimate bearing capacity in pure clay with an unconfined compressive strength of 0.15 N/mm2, ø=0° and γ=1.7 gm/cm$^3$. Assume Terzaghi's theory. Given for ø=0°from Terzaghi's chart Nq = 1, Nc = 5.7 and Nγ = 0. **(3)**

(C) What is negative skin friction? What is its effect on the pile? **(3)**

**END OF PAPER**