**Seat No : _____** **Enrollment No: _____**

# GUJARAT TECHNOLOGICAL UNIVERSITY

**PDDC SEMESTER– V • EXAMINATION – SUMMER 2015**

**Subject Name : Foundation Engg.** **Date: 13/05/2015**

**Subject Code : X50603**

**Time: 02:30 pm - 05:00 pm** **Total Marks: 70**

Instructions :
(1) All questions are compulsory.
(2) Figures to the right indicates the marks.
(3) Use of Programmable calculator is strictly prohibited.
(4) Draw neat sketch wherever necessary.
(5) Write your seat no and enrollment no in space provided on the question paper.

Q.1 (a) Explain Standard penetration test. 07

(b) A square footing 2m x 2m carries a uniformly distributed load of 314 kN/m². find the intensity of vertical pressure at a depth of 6 m below a point 0.5 m inside each of the two adjacent side of footing. 07

Q.2 (a) Explain General shear failure and Local shear failure with neat sketch. 07

(b) A square footing 2.5 m X 2.5 m is built on a homogeneous bed of sand of density 19 kN/m$^3$ having an angle of shearing resistance of 36$^o$. The depth of foundation is 1.5 m below the ground surface. Calculate the safe load that can be applied on the footing with a factor of safety of 3. Take bearing capacity factors as $N_c$= 27, $N_q$ = 30, $N_\gamma$ = 35. 07

**OR**

(b) Discuss effect of inclination of load and water table on bearing capacity. 07

Q.3 (a) How the load transferred by the pile? 07

(b) A 40 cm square pre-cast RCC pile is driven by 8 m into a sandy bed. The standard penetration test results, performed on this ground are given below 07

| Depth(m) | 1.5 | 3 | 4.5 | 6 | 7.5 | 9 | 10.5 | 12 |
|---|---|---|---|---|---|---|---|---|
| SPT-N values | 4 | 6 | 12 | 12 | 20 | 24 | 35 | 39 |

Compute the factor of safety available if 1000 kN of compressive load is applied on this pile.

**OR**

Q.3 (a) A precast concrete pile of size 40 cm X 40 cm is to be driven into stiff clay. The unconfined compressive strength of the clay is 150 kN/m$^2$. Determine the length of pile required to carry a safe working load of 300 kN with factor of safety is 2.5. 07

(b) Briefly explain Settlement of single pile and settlement of group of pile, 07

Q.4 (a) List properties of expansive soil and give details of any two from it. 07

(b) What are the effects of swelling of soils on buildings? 07

**OR**

Q.4 (a) How will you identify the collapsible soil? 07

(b) Explain types and uses of Geosynthetics. 07

Q.5 (a) Explain factors affecting selection of type of foundation. 07

(b) Write purposes of site investigation. 07

**OR**

(a) Enlist boring methods and explain any one in detail. 07

(b) Explain Plate load test. 07