KATIHAR ENGINEERING COLLEGE, KATIHAR

DEPARTMENT OF CIVIL ENGINEERING

Subject: Foundation Engineering   **Maximum Marks:** 05

Time: 30 Minutes   **Instructor:** Rashid Mustafa

Test- I

Q.1 Consider the following statements regarding negative skin friction in piles:

 1. It is developed when the pile is driven through a recently deposited soil layer

 2. It is developed when the pile is driven through a layer of dense sand

 3. It is developed due to sudden drawdown of the water table.

Which of the statements given above is/are correct?

   (a) 1 only   (b) 2 only   (c) 2 and 3   (d) 1 and 3

Q.2 The immediate settlement of a column (in mm) footing 1.5 m diameter that is constructed upon an unsaturated soil layer, given that total load carried by the column is 150 kN, Es = 7000 kPa, $v = 0.25$, assuming that the footing to be rigid and influence factor as 0.79 is -----------------

Q.3 (α) Plate load test is useful to estimate

       (a) Bearing capacity of foundation   (b) settlement of foundation

       (c) Both bearing capacity and settlement   (d) depth of foundation

    (β) A soil has c = 30 kN/m^2 and $\Phi = 27^o$ then type of shear failure, mobilized cohesion(c_m) and mobilized angle of internal friction(Φ_m) used to calculate bearing capacity of soil are respectively

       (a) General, 30kN/m^2, $\tan^{-1}(27)$ (b) Local, 30kN/m^2, $\tan^{-1}(27)$

       (c) General, 20kN/m^2, $\tan^{-1}(18)$ (d) Local, 20kN/m^2, $\tan^{-1}(18)$

Q.4 A 1 m x 1m surface footing in a saturated clay soil with $\Phi = 0$ has the ultimate bearing capacity of 4q. The ultimate bearing capacity of a surface footing of dimension 4 mx 4 m on the same soil will be ---------------------

Q.5 Match List-I (In situ test) with List-II (Measurement parameter) and select the correct answer using the codes given below the lists is --

List-I	List-II
A. SPT test	**1.** Penetration resistance (N value)
B. Plate load test	**2.** Load- Settlement data
C. Field vane shear	**3.** Point resistance and skin resistance
D. CPT test	**4.** In situ torque strength

Q.6 A 30 cm diameter friction pile is embedded 10 m into a homogeneous consolidated deposit. Cohesion between pile and clay is 4 t/m^2 and adhesion factor is 0.70. The safe load for a factor of safety 2.5 will be ------------------------------- tonne.

Q.7 (α) Minimum centre to centre spacing of friction pile of diameter (D) as per BIS code is ------------

(β) The weight of hammer and height of fall used in SPT test is -------------kg and----------cm

Q.8 A drop hammer is used to drive a wooden pile. The hammer weightis 25 kN and its free falling height is 0.80 m. The penetration in the last blow is 12 mm. the allowable load carrying capacity of the pile (in kN) according to Engineering News formula is

(a) 125 kN   (b) 110 kN   (c) 3000 kN   (d) 90 kN

Q.9 The load carrying capacity of an individual friction pile is 200 kN. What is the total load carrying capacity of a group of 9 such piles with group efficiency factor of 0.90 is -------------kN

Q.10 The observed N value from a standard penetration test conducted in saturated sandy strata is 30. The N- value corrected for dilatancy may be taken as

(a) 15   (b) 20   (c) 23   (d) 39

<END OF THE QUESTION PAPER>

NOTE: Solution of class test-I will be uploaded on the college website **www.keck.ac.in**