Seat No.: _____   Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE SEM-VI Examination-Nov/Dec-2011

Subject code: 160606   **Date: 02/12/2011**
Subject Name: Geotechnical Engineering - II
Time: 10.30 am -1.00 pm   **Total marks: 70**

Instructions:
1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Draw neat and clean sketches with pencil only.**

Q.1 **(a)** A strip footing 2 m wide carries a load intensity of $400kN/m^2$ at a **07**
depth of 1.2 m in sand. The saturated unit weight of sand is $19.5kN/m^2$
and unit weight above water table is $16.8kN/m^2$. The shear strength
parameters are c= 0 and $\emptyset = 35^0$. Determine the factor of safety w.r.to
shear failure. For case (a) water table is 4 m below GL (b) water table
at GL itself. Adopt $Nq = 41.4$ and $N\gamma = 42.4$.

(b) Write a short note on floating foundation.   **07**

Q.2 **(a)** Explain in detail "Under Reamed Pile Foundation".   **07**
(b) Describe "Negative skin friction"   **07**
OR
(b) Write short note on "Pile Load Test".   **07**

Q.3 **(a)** Explain Friction Circle method.   **07**
(b) A slope is to be constructed at an inclination of 30^0 with the horizontal. **07**
Determine the safe height of the slope at factor of safety of 1.5. The
soil has following properties, $c = 15 \ kN/m^2$, $\emptyset = 22.5^0$, $\gamma = 19 \ kN/m^3$.
Use following table for Sn.

$\emptyset m = 15^0$, $i = 30^0$	Sn = 0.046
$\emptyset m = 10^0$, $i = 30^0$	Sn = 0.040

OR
Q.3 **(a)** Explain "Bishop's Method of stability analysis".   **07**
(b) Calculate the factor of safety with respect to cohesion, of a clay slope **07**
laid at 1 in 2 to a height of 10 m, if the angle of internal friction $\emptyset = 10^0$, $c = 25 \ kN/m^2$, and $\gamma = 19 \ kN/m^3$. What will be the critical height
of the slope in this soil? Use following table for Sn.

$\emptyset = 15^0$, $i = 26.5^0$	Sn = 0.060
$\emptyset = 10^0$, $i = 26.5^0$	Sn = 0.064

Q.4 **(a)** Explain "Culmann's graphical method for active pressure".   **07**
(b) Write a short note on "Active Earth Pressure for Cohesive Soils".   **07**
OR
Q.4 **(a)** Explain "Rebhann's graphical method for active earth pressure".   **07**

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(b) A retaining wall of 4 m high, has a smooth vertical back. The backfill **07** has a level with the top of the wall. There is a uniformly distributed surcharge load of 36 kN/m^2, intensity over backfill. The unit weight of the backfill is 18 kN/m^3, its angle of shearing resistance is 30^0 and cohesion is zero. Determine the magnitude and point of application of active earth pressure per metre length of the soil.

Q.5 **(a)** Write short note on "New mark's influence chart". **07**
(b) Derive the "Boussinesq equation of vertical stress and tangential stress **07** subjected to concentrated force.

OR

Q.5 **(a)** Explain in detail about the factors affecting the selection of type of **07** foundation.
(b) Write in short "Methods of site Exploration". **07**

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