

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 depth of 1.2 m in sand. The saturated unit weight of sand is 19.5kN/m^3 and unit weight above water table is 16.8kN/m^3 . The shear strength parameters are $c = 0$ and $\phi = 35^\circ$. 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 $N_q = 41.4$ and $N_\gamma = 42.4$. **07**

- (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° with the horizontal. Determine the safe height of the slope at factor of safety of 1.5. The soil has following properties, $c = 15\text{ kN/m}^2$, $\phi = 22.5^\circ$, $\gamma = 19\text{ kN/m}^3$. Use following table for S_n . **07**

$\phi_m = 15^\circ, i = 30^\circ$	$S_n = 0.046$
$\phi_m = 10^\circ, i = 30^\circ$	$S_n = 0.040$

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 laid at 1 in 2 to a height of 10 m, if the angle of internal friction $\phi = 10^\circ$, $c = 25\text{ kN/m}^2$, and $\gamma = 19\text{ kN/m}^3$. What will be the critical height of the slope in this soil? Use following table for S_n . **07**

$\phi = 15^\circ, i = 26.5^\circ$	$S_n = 0.060$
$\phi = 10^\circ, i = 26.5^\circ$	$S_n = 0.064$

- 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**

- (b) A retaining wall of 4 m high, has a smooth vertical back. The backfill 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° and cohesion is zero. Determine the magnitude and point of application of active earth pressure per metre length of the soil. **07**

Q.5 (a) Write short note on “New mark’s influence chart”. **07**

- (b) Derive the “Boussinesq equation of vertical stress and tangential stress subjected to concentrated force. **07**

OR

Q.5 (a) Explain in detail about the factors affecting the selection of type of foundation. **07**

- (b) Write in short “Methods of site Exploration”. **07**
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