Enrollment No: _____ Exam Seat No:_____

C. U. SHAH UNIVERSITY

Winter Examination-2019

Subject Name : Geotechnical Engineering II

Subject Code : 4TE06GTE1 Branch: B.Tech (Civil)

Semester: 6 Date: 18/09/2019 Time: 10:30 To 01:30 Marks: 70

Instructions:

(1) Use of Programmable calculator & any other electronic instrument is prohibited.
(2) Instructions written on main answer book are strictly to be obeyed.
(3) Draw neat diagrams and figures (if necessary) at right places.
(4) Assume suitable data if needed.

Q-1 Attempt the following questions: (14)

a) Draw the following failure of slope: 5
   (1) Wedge failure
   (2) Compound failure
   (3) Base failure
   (4) Translation failure
   (5) Toe failure

b) According to Terzaghi 's theory, how net ultimate bearing capacity of clay is expressed ? 1

c) Give the value of FOS in limiting equilibrium method of stability. 1

d) Give the value of Φ for fully saturated clays under undrained condition, the analysis shall be carried out as a total stress analysis for stability checking. 1

e) If the disturbing moment is multiplied by its FOS then which entity you are getting? 1

f) What is backfill? 1

g) What is surcharge angle? 1

h) What is plastic equilibrium of soil? 1

i) Give only two causes of stress in soil. 1

j) Give only two assumptions in Boussinesq equation. 1

Attempt any four questions from Q-2 to Q-8

Q-2 Attempt all questions (14)

(a) What is the effect of tension crack in the stability analysis of a finite slope? **07**

(b) Write a note on Newmark's influence chart. **07**

Q-3 Attempt all questions (14)

(a) Calculate the total active thrust and its point of application on a vertical wall 6m high retaining a sand of bulk unit weight 18 KN/m^3 and Φ is 35^0. The water table is 2m below the ground surface. The saturated unit weight of sand is 20 KN/m^3. Take unit weight of water 10 KN/m^3. **10**

	(b)	Write short note on geostatic stress.	**04**
Q-4		**Attempt all questions**	**(14)**
	(a)	Explain Rebhann's graphical method to determine earth pressure.	**10**
	(b)	Describe the usefulness of an isobar.	**04**
Q-5		**Attempt all questions**	**(14)**
	(a)	Discuss various step in choosing the type of foundation.	**07**
	(b)	How a slope is analyzed using Swedish circle method? Derive an expression for factor of safety.	**07**
Q-6		**Attempt all questions**	**(14)**
	(a)	Explain the cone penetration test with neat sketch.	**07**
	(b)	A concrete pile of 45 cm diameter is driven to depth a depth of 16m through a layered system of sandy soil(C=0). The following data are available. Top layer 1: thickness = 8m, γ_d = 16.5 KN/m^3, e = 0.60 and $\Phi = 30^0$ Layer 2 : thickness = 6m, γ_d = 15.5 KN/m^3, e = 0.65, $\Phi = 35^0$ Layer 3 : Extend to a great depth, γ_d = 16.0 KN/m^3, e = 0.65, $\Phi = 38^0$ Assume that the values of δ in all the layers of sand is equal to 0.75Φ. The value of K_s for each layer as equal to half of the passive earth pressure coefficient. The water table is at ground level. Calculate the values of Q_u and Q_a with F_s = 2.5 by the conventional method for Q_f and berezantsav's method for Q_b.	**07**
Q-7		**Attempt all questions**	**(14)**
	(a)	Derive Terzaghi's ultimate bearing capacity equation.	**08**
	(b)	A concrete pile of 40 cm diameter is driven into homogeneous mass of cohesion less soil. The pile carries a safe load of 650 KN. A static cone penetration test conducted at the site indicates an average value of q_c = 40 kg/cm^2 along the pile and 120 kg/cm^2 below the pile tip. Compute the length of the pile with F_s 2.5	**06**
Q-8		**Attempt all questions**	**(14)**
	(a)	Describe plate load test with neat sketch.	**07**
	(b)	Write the selection criteria of pile.	**07**