B.E. Civil Engineering Sixth Semester CE604 - Geotechnical Engineering - II

P. Pa Time	ges : : Th	2 ree Hours	S GUG	F/W/18/1670 ax. Marks : 80
	Note	s: 1. 2. 3. 4. 5.	All questions carry equal marks. Answer all questions. Due credit will be given to neatness and adequate dimensions. Assume suitable data wherever necessary. Illustrate your answers wherever necessary with the help of neat sketches	 š.
1.	a)	Explain disturba	split Spoon sampler and also discuss the design features governing the de ance.	gree of 8
	b)	Explain	SPT and its corrections.	8
			OR	
2.	a)	Explain	the importance of General and detailed exploration in brief.	8
	b)	Explain	any one method of Geophysical exploration with its merit and demerits.	8
3.		An emb c = r = α_a r_{sat} H The	$\begin{aligned} & \text{pankment is made of soil having following properties.} \\ &= 20 \text{ kN / m}^2 \qquad \varphi = 20^\circ \\ &= 19 \text{ kN / m}^3 \qquad j = 45^\circ \\ &\alpha_\beta = 35^\circ \\ &\alpha_\beta = 35^\circ \\ &\alpha_\beta = 35^\circ \\ &\alpha_\beta = 10 \text{ mt.} \end{aligned}$	16
			OR	
4.	a)	Explain	with neat sketch Friction circle method.	8
	b)	Derive t	the expression for critical height for an infinite slope of $\mathbf{C} - \boldsymbol{\phi}$ soil.	8
5.	a)	Explain stepwise	the Rebhann's construction for active earth pressure when 'j' is nearly eque.	al to ' ¢' 8
	b)	For the v of the w i) If a bac ii) Co	vertical retaining wall 8 m high, find the safe distance of the footing from /all. The details are given below. a line load of 100 kN/m acts at a distance 2.9m from the face of the wall. T ckfill is horizontal.	the back 8 The

6. a) A two layer cohesive backfill (horizontal) is supported by a 12 m high vertical smooth wall. 10 Determine the Rankine active E.P. per unit length of the wall before and after formation of crack. Occurs in the top layer.

The details of soil layers are given below <u>0-6 mt</u>. Top layer $C_u = 13 \text{ kPa}, \quad \phi_u = 0^\circ, \quad r = 17 \text{ kN/m}^2$ <u>6-12 bottom layer</u> $C_u = 35 \text{ kPa}, \quad \phi_u = 10^\circ, \quad r_{sat} = 20 \text{ kN/m}^3$ The W.T. is at the interface of two layers.

- b) State the assumption made by Rankine E.P. theory.
- 7. a) Explain the effect of size of plate an bearing capacity and on settlement for plate load test. 6
 - b) A rectangular footing has a size of 1.8 m x 2.5 m has to transmit the load of a column at a depth of 1.5 m. Calculate the rate load which the footing can carry at a FOS of 3 against the shear failure. Use I.S. safe method. The soil has following properties. n = 40%, G = 2.67, w = 15% c = 08 kN/m², $\phi = 32^{\circ}$ 5' consider = Nc = 38.13, Nq = 25.85, Nr = 35.21

OR

- **8.** a) Explain Geotextiles and its applications in brief.
 - b) Determine the depth at which a circular footing of 2 m dia. be founded to provide a FOS of 3, if it has to carry a safe level of 1600 kN. The foundation soil has C = 12 kPa, $\phi = 30^{\circ}$, and unit wt. 18 kN/m³. Use Terzaghi's analysis. Consider for $\phi = 30^{\circ}$.

 $N_c = 37.2, N_q = 22.5, N_r = 19.7$

- 9. a) Explain the construction of undereamed piles and its L.C.C.
 - b) Design a friction pile group to carry a load of 3000 kN including the weight of the pile cap. 8 at a site where soil is uniform clay to a depth of 20m, underlain by rock. The average unconfined compressive strength of clay is 80 kN/m². A FOS of 3 is required against shear failure.

OR

10.	a)	Explain Feld's Rule with the help of neat sketches.	6
	b)	Explain negative skin friction and its importance.	4
	c)	Explain Vibroflotation and its significance.	6

2

8

6

8