GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–VI (OLD) - EXAMINATION – SUMMER 2018

Subject Code:160606   **Date:03/05/2018**
Subject Name:Geotechnical Engineering - II
Time:10:30 AM to 01:00 PM   **Total Marks: 70**
Instructions:
1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Write down the step by step, Swedish Slip Circle method of finding the factor of safety for purely cohesive soils and C- Φ soils.	**07**
	(b)	An embankment is inclined at an angle of 35° and its height is 15 m. the angle of shearing resistance is 15°and the cohesion is 20 kN/m^2 . The unit weight of soil is 18 kN/m^3 . If the Taylor's stability number is 0.06, determine the FS with respect to cohesion.	**07**
Q.2	**(a)**	How would you estimate the load carrying capacity of a pile, using a pile load test ? Discuss the procedure at length.	**07**
	(b)	A pile group consists of 9 friction piles of 30 cm diameter and 10 m. length driven in clay (Cu = 100 kN/m^2 ; γ = 20 kN/m^3). The piles are provided in 3x3 square pattern, and c/c spacing between piles is 0.75 m. Determine the safe load for the group (FS = 3 ; α = 0.6)	**07**

OR

	(b)	Enlist various dynamic formula to determine the load carrying capacity of pile. Discuss Hiley's formula in detail.	**07**
Q.3	**(a)**	What are the different types of Earth pressures ? Give examples.	**07**
	(b)	A retaining wall, 5 m high, with vertical smooth back, is supporting the soil, which is consisting of two layers. The upper soil layer, 2.5 m. thick, is having Φ = 35°, and γ = 17 kN/m2, whereas lower soil layer is having Φ = 38°, and γ$_{sat}$ = 18 kN/m^3. The upper surface of the fill is horizontal. Water table is at 2.5 m. depth from top of retaining wall. Determine the active pressure on the retaining wall. Take γ$_w$ = 10 kN/m^3.	**07**

OR

Q.3	**(a)**	Discuss Culmann's method for determination of active earth pressure.	**07**
	(b)	A five meter high retaining wall is having smooth vertical back. It is retaining soil, which is having c = 5 kN/m^2 ; Φ = 30° , and γ = 17.5 kN/m^3. Determine the Rankine's Active pressure on the wall , (a) Before the formation of crack, and (b) After the formation of crack.	**07**
Q.4	**(a)**	What are the functions of foundation ? Discuss the causes of failure of foundations.	**07**
	(b)	What do you understand by Contact pressure ? What are the factors that affect the contact pressure distribution ?	**07**

OR

Q.4	**(a)**	Discuss the Electrical Resistivity method for subsoil investigation.	**07**
	(b)	Discuss the basis of the construction of Newmark's Influence chart. How is it used ?	**07**
Q.5	**(a)**	Discuss the various factors that affect the bearing capacity of a shallow foundation.	**07**
	(b)	Discuss the Plate load test. What are its limitations ?	**07**

OR

Q.5 **(a)** Differentiate clearly between General Shear failure and Local shear failure of soil. How the ultimate bearing capacity, in case of Local shear, is determined ? **07**

(b) Discuss various components of foundation settlements which can occur under loads. Discuss briefly, the methods to compute the same for Cohesive (c-Φ) soils. **07**

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