Seat No.: Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– VI (Old) EXAMINATION – WINTER 2019

Subject Code: 160606 **Date: 09/12/2019**

Subject Name: Geotechnical Engineering - II

Time: 02:30 PM TO 05:00 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)**	Analyse finite slope of purely cohesive soil (Øu = 0) by Swedish circle method.	**07**
	(b)	Explain how to determine factor of safety for the stability analysis of infinite slope.	**07**
Q.2	**(a)**	Explain active earth pressure, passive earth pressure and earth pressure at rest.	**07**
	(b)	Compute the intensities of active and passive earth pressure at depth of 8m in dry cohesionless sand with an angle of internal friction of 30˚ and unit weight of 18 kN/m^3. What will be the intensities of active and passive earth pressure if the water level rises to the ground level? Take saturated unit weight of sand as 22 kN/m^3.	**07**
		OR	
	(b)	Explain Culmann's graphical method for theory of earth pressure.	**07**
Q.3	**(a)**	Derive Boussinesq's equation to calculate intensities of vertical pressure directly below the point load on axis of loading.	**07**
	(b)	A water tank is supported by a ring foundation having outer diameter of 10 m and inner diameter of 7.5 m. The ring foundation transmits uniform load intensity of 160 kN/m^2. Compute the vertical stress induced at a depth of 4 m, below the centre of ring foundation, using (a) Boussinesq's analysis and (b) Westergaard's analysis taking μ = 0.	**07**
		OR	
Q.3	**(a)**	Explain different types of soil Samplers to collect soil samples from the ground.	**07**
	(b)	Describe standard penetration test. How the observed N – value is corrected?	**07**
Q.4	**(a)**	What are the factors affects the selection of type of foundations? Explain in detail.	**07**
	(b)	Write short note on Electrical resistivity method.	**07**
		OR	
Q.4	**(a)**	Describe classification of piles in detail.	**07**
	(b)	A pile is driven with a single acting hammer of weight 15 kN with a free fall of 900 mm. The first set, the average of the last three blows, is 27.5 mm. Find the safe load using the Engineering News formula.	**07**
Q.5	**(a)**	Write the short note on: (A) Group efficiency of pile (B) Negative skin friction	**07**
	(b)	Explain Terzaghi's bearing capacity theory with assumptions.	**07**
		OR	
Q.5	**(a)**	Explain the plate load test in detail.	**07**
	(b)	Compute the safe bearing capacity of a continuous footing 1.8 m wide, and located at a depth of 1.2 m below ground level in a soil with unit weight 20 kN/m^3, c = 20 kN/m^2, and Ø = 20˚. Assume factor of safety of 2.5. Terzaghi's bearing capacity factors for Ø = 20˚ are Nc = 17.7, Nq = 7.4 and Nγ = 5. What is the permissible load per meter run of the footing?	**07**

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