Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VIII (NEW) EXAMINATION – WINTER 2017

Subject Code: 2180609 **Date: 02/11/2017**

Subject Name: Foundation Engineering

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.**

			MARKS
Q.1	**(a)**	State different types of shallow foundation. Explain any one with neat sketch.	**03**
	(b)	Discuss the various factors affecting sample disturbance.	**04**
	(c)	What do you understand by site investigation? What are the different purposes for which site investigations are made?	**07**
Q.2	**(a)**	What is significant depth for foundation?	**03**
	(b)	Discuss under which circumstances mat foundation recommended.	**04**
	(c)	Describe plate load test with neat sketches.	**07**
		OR	
	(c)	Determine the allowable gross load and the net allowable load for a square footing of 2 m side and with a depth of foundation of 1 m. Use Tarzaghi's theory and assume local shear failure. Take factor of safety of 3. The soil at the site has $\gamma = 18$ kN/m^3, $c' = 15$ kN/m^2 and $\emptyset' = 25^\circ$. Take $N_c' = 14.8$; $N_q' = 5.6$; $N_\gamma' = 3.2$	**07**
Q.3	**(a)**	What is negative skin friction? Explain with figure.	**03**
	(b)	How do you estimate the group capacity of piles in sand?	**04**
	(c)	A group of 16 piles of 50 cm diameter is arranged with centre to centre spacing of 1 m. The piles are 9 m long and are embedded in soft clay with cohesion 30 kN/m^2. Bearing resistance may be neglected for the piles. Adhesion factor is 0.6. Determine the ultimate load capacity of the pile group.	**07**
		OR	
Q.3	**(a)**	Write dynamic formulae to estimate pile capacity.	**03**
	(b)	Write short note on efficiency of pile group.	**04**
	(c)	A square group of 9 piles was driven into soft clay extending to a large depth. The diameter and length of piles were 30 cm and 9 m respectively. If the unconfined compression strength of the clay is 90 kN/m^2, and the pile spacing is 90 cm centre to centre, what is the capacity of the group? Assume the factor of safety of 2.5 and adhesion factor of 0.75	**07**
Q.4	**(a)**	Discuss Characteristics of expansive soil.	**03**
	(b)	Write Short note on Under reamed pile.	**04**
	(c)	Explain in detail various uses of geosynthetics.	**07**
		OR	
Q.4	**(a)**	Explain identification of collapsible soils.	**03**

	(b)	List various types of geosynthetics with their functions.	**04**
	(c)	Discuss the method of estimating immediate settlement of foundation on clay.	**07**
Q.5	**(a)**	Enlist different types of retaining wall with sketch.	**03**
	(b)	Explain construction method of sheet pile wall.	**04**
	(c)	Write Short note on soldier piles and lagging.	**07**

OR

Q.5	**(a)**	Difference between cantilever retaining wall and counterfort retaining wall.	**03**
	(b)	Define swelling potential and swelling pressure.	**04**
	(c)	Explain effect of ground water table on safe bearing capacity of soil	**07**

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