

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 Terzaghi's theory and assume local shear failure. Take factor of safety of 3. The soil at the site has $\gamma = 18 \text{ kN/m}^3$, $c' = 15 \text{ kN/m}^2$ and $\phi' = 25^\circ$. 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**
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- (c) Discuss the method of estimating immediate settlement of foundation on clay. **07**
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- 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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