

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VIII (NEW) EXAMINATION – WINTER 2018

Subject Code: 2180609

Date: 26/11/2018

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.

- Q.1**
- (a) Define bearing capacity, gross bearing capacity and net bearing capacity. **03**
- (b) Classify the different methods to determine bearing capacity of soil. **04**
- (c) A strip footing of width 3m is founded at a depth of 2.2m below the ground surface in a c- ϕ soil having cohesion 30 kN/m² and angle of internal friction 32°. The water table is at a depth of 5m below ground surface. The moist soil above the water table is 17 kN/m³. Determine the safe bearing capacity and safe load per m length of the footing. Consider factor of safety is 3 and take bearing capacity factor $N_c = 57.8$, $N_q = 41.4$ and $N_\gamma = 42.4$. **07**

- Q.2**
- (a) Differentiate between disturbed and undisturbed soil sample. **03**
- (b) What is site investigation? What are the purpose of site investigation? **04**
- (c) Describe the standard penetration test. How the observed N-value is corrected? **07**

OR

- (c) Enlist the different geophysical method. Explain any one in detail with its limitations. **07**
- Q.3**
- (a) What are the necessity of pile foundation? **03**
- (b) Classify the piles on the basis of their function with sketches. **04**
- (c) A group of 9 x 9 piles, 9 m long is used as the foundation of column. The piles are 30cm in diameter with centre to centre spacing 90cm. The subsoil consists of clay with unconfined compressive strength 160 kN/m². Estimate safe load considering factor of safety as 3. **07**

OR

- Q.3**
- (a) What are the advantages of steel pile, timber pile and composite pile? **03**
- (b) Differentiate between end bearing pile and friction pile. **04**
- (c) A drop hammer weighing 55kN and having an effective fall of 0.70m drives an RCC pile weighing 35kN. The average settlement per blow is 1.3cm. The total temporary elastic compression is 1.7cm. Assuming coefficient of restitution as 0.25 and factor of safety 3.0, determine ultimate bearing capacity and allowable bearing capacity. **07**

Q.4	(a)	What is CNS layer? Explain concept of CNS layer.	03
	(b)	What are the different type of the foundation provided on expansive soil? Draw the detail sketch of any one foundation.	04
	(c)	Explain different function of geosynthetics in detail with figures.	07

OR

Q.4	(a)	Define collapsible soil. How it is identified?	03
	(b)	Draw the typical collapsible soil structure.	04
	(c)	What are the different application area of geosynthetics? Explain each application in detail.	07
Q.5	(a)	Name the different forces act on retaining wall.	03
	(b)	Name the types of retaining wall. Draw any two figures by showing all parts of the retaining wall.	04
	(c)	Explain construction method of sheet pile wall.	07

OR

Q.5	(a)	What are the application of retaining wall?	03
	(b)	Prepare short note on drainage of the backfill.	04
	(c)	Describe in detail construction of the diaphragm wall.	07
