R15

Code No: 126WV

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, April - 2018

FOUNDATION ENGINEERING

(Common to CEE, CE)

Time: 3 hours **Max. Marks: 75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

1.a)	Define the area ratio.	[2]
b)	Describe standard penetration test.	[3]
c)	What are the assumptions made in Bishops theory?	[2]
d)	Discuss the factors leading to the failure of soil slopes.	[3]
e)	What are the assumptions in Coulomb's theory?	[2]
f)	What is the practical significance of earth pressure theory?	[3]
g)	The load carrying capacity of end bearing pile is estimated as 100 kN. How the capacity can be doubled for the same length?	[2]
h)	State the factors affecting location of footing.	[3]
i)	Comment on well sinking.	[2]
j)	Write a note on shifts?	[3]

PART - B

(50 Marks)

2. Explain with neat sketch how dynamic cone penetration test is carried out in the field. [10]

OR

3. If you are in-charge of subsoil exploration of important structures, how would you decide the depth of exploration? List out the factors you will consider and their importance. [10]

4. What are the assumptions that are generally made in the analysis of the stability of slopes? Discuss the factors leading to the failure of soil slopes. Also sketch the different types of slope failures. [10]

OR

5.a) What is meant by infinite slope? What is the criterion for the stability of an infinite slope in sand?

b) Define various factors of safety used in the analysis of stability of slopes. [5+5]

6.a) Explain about the construction of Culmann's graphical method.
b) Write a note on stability of earth retaining structures. [5+5]

OR

7. A retaining wall has a smooth vertical back and is 8.5m in height. It retains a horizontal backfill of sand with $\phi = 33^0$. Find out the total active earth pressure per meter length of wall, if $\gamma = 18$ kN/m^3 and $\gamma_{sat} = 20$ kN/m^3
a) The water table is far below the base of the wall
b) The water table rises up to 4.0 m level above the base. [5+5]

8.a) How do you estimate the settlement of a footing on sand using plate load test? How is depth correction applied?
b) The foundation for a Square footing of width 2m is to be founded at a depth of 1.5m. The soil properties are $c=0$, $\phi=36^0$, $\gamma=18.2$ kN/m^3, $\gamma sat=20$ kN/m^3. Determine the net ultimate bearing capacity, when the water table is at
i) 1 m below ground level
ii) 1 m below foundation level
(for $\phi=36^0$, Nc=52, Nq= 32 & N γ=35) [5+5]

OR

9. A bored concrete pile 30 cm diameter and 6.50 m length passes through stiff fissured clay subjected to seasonal shrinkage and swelling upto a depth of 1.50 m. The average undrained shear strength of clay is 50 kPa upto pile tip and 100 kPa below the pile tip. Find the ultimate load carrying capacity assuming adhesion factor of 0.3 and neglect the top 1.50 m soil. [10]

10.a) What considerations govern the fixing of the depth of a well foundation.
b) What do you understand by grip length? What is its importance in well foundations? [5+5]

OR

11. Briefly explain the procedure adopted in well sinking and bring out the problems that are encountered in open sinking. [10]

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