PAPER ID-420390

Subject Code: KCE064

Roll No: | | | | | | | | | | | | | |

BTECH
(SEM VI) THEORY EXAMINATION 2021-22
FOUNDATION DESIGN

Time: 3 Hours *Total Marks: 100*

Note: Attempt all Sections. If you require any missing data, then choose suitably.

SECTION A

1. Attempt *all* questions in brief. **2*10 = 20**

Q.no	Questions	CO
(a)	Enlist the various field methods to determine bearing capacity of soil?	1
(b)	Define area ratio?	1
(c)	Write the factors affecting bearing capacity of soil?	2
(d)	Write the equation for the ultimate bearing capacity.	2
(e)	Describe various types of pile foundation.	3
(f)	Define battered Pile.	3
(g)	Describe "Steining" in Well Foundation.	4
(h)	Write down the forces acting on well foundation.	4
(i)	What do you understand by soil reinforcement?	5
(j)	Write down the two practical application of sheet pile.	5

SECTION B

2. Attempt any *three* of the following: **10*3 = 30**

Q.no	Questions	CO
(a)	Describe various methods of drilling holes for subsurface investigations.	1
(b)	A strip footing, 1m wide at its base is located at a depth of 0.8m below the ground surface. The properties of the foundation are unit weight of soil is 18kN/m^3, c = 30kN/m^{2}and angle of internal friction is 20°. Determine the safe bearing capacity, using a factor of safety of 3. Use Terzaghi's analysis. Assume that the soil fails by local shear.	2
(c)	A pile group consists of 9 friction piles of 30cm diameter and 10m length driven in clay (c_u = 100kN/m^2, unit weight of soil (γ) = 20 kN/m^3), centre to centre spacing is 0.75m arranged in a square pattern. Determine the safe load for the group (F.O.S = 3, α = 0.6)	3
(d)	Discuss the principles of design of footings.	4
(e)	Discuss the geophysical methods of soil explorations?	5

SECTION C

3. Attempt any *one* part of the following: **10*1 = 10**

Q.no	Questions	CO
(a)	Describe standard penetration test. What are the various corrections?	1
(b)	Discuss various types of soil samplers for obtaining undisturbed samples.	1

QP22EP1_032 | 13-06-2022 13:25:24 | 117.55.241.2

Roll No: | | | | | | | | | | | | | |

BTECH
(SEM VI) THEORY EXAMINATION 2021-22
FOUNDATION DESIGN

4. Attempt any *one* part of the following: 10 *1 = 10

Q.no	Questions	CO
(a)	A footing 2m square is laid at a depth of 1.3m below the ground surface. Take unit weight of soil as 18kN/m^3, angle of internal friction (Φ) = 30^0 and c= 0. Determine the net ultimate bearing capacity using Terzaghi's method if a) The water table rises to the level of the base. b) The water table is 1m below the base.	2
(b)	A circular footing is resting on a stiff saturated clay of q_u=250 kN/m^2. The depth of foundation is 2m. Determine the diameter of the footing if the column load is 600kN.Assume factor of safety=2.5, unit weight of soil is 20 kN/m^3?	2

5. Attempt any *one* part of the following: 10*1 = 10

Q.no	Questions	CO
(a)	A concrete pile, 9m long was driven by a single acting Vulcan Hammer with rated energy 35.26kJ. the total settlement as recorded for the last 10 blows was 2.5 mm/blow. Using Engineering News formula, calculate the pile capacity.	3
(b)	A nine-pile group arranged in a square pattern is used as a foundation for a column in sand (Φ' = 32°), piles 300 mm in diameter and 10m in length, are placed at a spacing of 900mm in each direction. Calculate the ultimate load capacity of the pile group. Assume that the unit weight of soil is 18kN/m^3. Take N_q =27.	3

6. Attempt any *one* part of the following: 10*1 = 10

Q.no	Questions	CO
(a)	What are different shapes of wells? Describe the characteristics of each type.	4
(b)	What is a retaining wall? Write down its applications. Explain any two types of retaining structures.	4

7. Attempt any *one* part of the following: 10*1 = 10

Q.no	Questions	CO
(a)	What are the types of Soil reinforcements? Explain geotechnical properties of reinforced soil.	5
(b)	Describe the elastic models of soil behaviour and their limitations in detail.	5

QP22EP1_032 | 13-06-2022 13:25:24 | 117.55.241.2