



R20 Regulation

Subject code: 3E7AE

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech VII Semester Regular Examinations, November 2023

FOUNDATION ENGINEERING (CIVIL ENGINEERING)

Maximum Marks: 70

Date:06.12.2023 Duration: 3 hours

- Note:
- 1.This question paper contains two parts A and B.
 2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
 3. Part B consists of 5 Units. Answer any one full question from each unit which carries 10M.
 4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks

(10x2M=20 Marks)

Bloom

		Bloom
1	What do you understand by geophysical method of soil exploration?	Tx
2	Define unsaturated soil sample with example ?	L1
3	How to define Taylor stability Number?	L2
4	Define Finite and infinite slopes of earth.	L2
5	What is the importance of Culmanns Graphical Method?	L1
6	What is the role of stability of retaining walls in civil engineering constructions?	L1
7	What are the limitations on IS methods of soils?	L1
8	What are the limitations of Meyerhof analysis?	L1
9	What is the difference between pile foundation and well foundation?	L1
10	What is native friction?	L1

Part-B

Answer All the following questions.

(5X10M=50Marks)

11	A. Define significant depth of soil exploration with neat examples? (5M) B. Give values for depth of soil exploration and number of bore holes for multistoried buildings, closely spaced footings? (5M)	L2 L2
OR		
12	A. Describe open excavation methods of exploration with sketches? (5M) B. What are the advantages and disadvantages of open excavation methods of exploration? (5M)	L2 L1
13	A. Explain stability analysis by Swedish arc method with neat sketches? (5M) B. Briefly discuss about slope failures analysis with figures? (5M)	L2 L3
OR		
14	A. Why stability of slopes of earth dams is more precious under different end conditions? (5M) B. What are the practical applications of Taylor's stability number? (5M)	L3 L1

15	A. Why does retaining wall undergo sliding? Discuss how the factor of safety is estimated against sliding of retaining wall? (5M) B. How to find out drainage from backfill practically and theoretically? (5M)	L3 L3																				
OR																						
16	A. Discuss about factor of safety against overturning and sliding for cantilever retaining wall? (5M) B. Outline the different types of retaining wall with neat sketches. (5M)	L3 L2																				
17	A. Determine net ultimate bearing capacity of the circular footing of size 2.5m located at 1.5m depth below ground level in pure clay soil and for the following cases: When water table is at (i) far below from foundation base and (ii) Ground level. Consider the following soil characteristics: cohesion = 50 kPa and unit weight of soil is 18 kN/m ³ . Use Terzaghi's theory. (5M) B. Square footing is founded at a depth of 1.75m in sand, for which the corrected N_c -value is 25. The water table is at a deeper depth. If the safe settlement pressure is 100 kPa for 25mm permissible settlement, estimate the footing size. (5M)	L3 L3																				
OR																						
18	A. A square footing 1.6m × 1.6m is placed over sand of density 17kN/m ³ and at a depth of 0.8m. The angle of shearing resistance is 20°. The bearing capacity factors are $N_c = 17.7$, $N_q = 7.4$ and $N_\gamma = 5.0$. Determine the total load that can be carried by the footing. (5M) B. A 4 m wide strip footing is founded at a depth of 1.5 m below the ground surface in c- ϕ soil. The water table is at a depth of 5.5 m below ground surface. The properties of soil are: $c' = 35$ kN/m ² , $\phi' = 28.63^\circ$, $\gamma_{sat} = 19$ kN/m ³ , $\gamma_{bulk} = 17$ kN/m ³ , $\gamma_w = 9.81$ kN/m ³ . Determine the net safe bearing capacity for local shear failure of soil using Terzaghi's theory (Use F.O.S = 2.5). The values of bearing capacity factors for different ϕ' are given below. (5M)	L3 L3																				
<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>ϕ'</th> <th>N_c</th> <th>N_q</th> <th>N_γ</th> </tr> </thead> <tbody> <tr> <td>15°</td> <td>12.9</td> <td>4.4</td> <td>2.5</td> </tr> <tr> <td>20°</td> <td>17.7</td> <td>7.4</td> <td>5.0</td> </tr> <tr> <td>25°</td> <td>25.1</td> <td>12.7</td> <td>9.7</td> </tr> <tr> <td>30°</td> <td>37.2</td> <td>22.5</td> <td>19.7</td> </tr> </tbody> </table>			ϕ'	N_c	N_q	N_γ	15°	12.9	4.4	2.5	20°	17.7	7.4	5.0	25°	25.1	12.7	9.7	30°	37.2	22.5	19.7
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19	A. Discuss about the classification of piles? (5M) B. Briefly discuss with clear illustrations how a bored pile is installed in-situ. (5M)	L2 L2																				
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20	A. Explain different types of wells with neat sketches. (5M) B. Explain sinking of wells with neat sketches and reminders for tilt and shift. (5M)	L2 L2																				