**20CE502**

**Hall Ticket Number:**

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| **III/IV B.Tech (Regular) DEGREE EXAMINATION** | | | |
| **February,2023** | **Civil Engineering** | | |
| **Fifth Semester** | **Foundation Engineering** | | |
| **Time:** Three Hours | | **Maximum: 7**0 Marks | |
| *Answer Question No. 1 Compulsorily.* | | | (14X1 = 14 Marks) |
| *Answer* ***ANY ONE*** *question from each Unit.* | | | (4X14=56 Marks) |

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| 1. | a) | Define Soil exploration. | CO1 | L1 | 1M |
|  | b) | What is the Meaning of SPT and DCPT. | CO1 | L1 | 1M |
|  | c) | What are the methods of boring? | CO1 | L1 | 1M |
|  | d) | How do you check the stability of retaining walls? | CO2 | L1 | 1M |
|  | e) | List out any two assumptions of Rankine’s earth pressure theory? | CO2 | L1 | 1M |
|  | f) | How to prevent land sliding? | CO2 | L1 | 1M |
|  | g) | Define area ratio. | CO1 | L1 | 1M |
|  | h) | Define coefficient of active earth pressure. | CO2 | L1 | 1M |
|  | i) | What are assumptions in terzaghi’s bearing capacity theory? | CO3 | L1 | 1M |
|  | j) | Define immediate settlement | CO3 | L1 | 1M |
|  | k) | List out the type of pile based on material used? | CO3 | L1 | 1M |
|  | l) | List out the types of wells. | CO4 | L1 | 1M |
|  | m) | How to identify expansive soils. | CO4 | L1 | 1M |
|  | n) | Define Angular Distortion | CO3 | L1 | 1M |
| **Unit -I** | | | | | |
| 2. | a) | Illustrate with neat sketch about the electrical conductivity method of soil exploration. | CO1 | L2 | 7M |
|  | b) | Outline about the various types of boring with neat sketches. | CO1 | L2 | 7M |
|  |  | **(OR)** |  |  |  |
| 3. | a) | State the objectives of soil exploration and Illustrate methods of soil exploration. | CO1 | L1 | 7M |
|  | b) | When the Standard penetration test is performed and explain the same in detail. | CO1 | L2 | 7M |
|  |  | **Unit -II** |  |  |  |
| 4. | a) | A 5-m-high retaining wall is shown in Fig. Determine a. Rankine active force per unit length of the wall b. Rankine passive force per unit length of the wall | CO2 | L3 | 7M |
|  | b) | State the assumptions in Rankine’s theory. Derive an expression for Active earth pressure. | CO2 | L2 | 7M |
| **(OR)**  **P.T.O**  **20CE502** | | | | | |
| 5. | a) | What is stability number? What is its utility in the analysis of stability of slopes? Discuss the uses of stability charts. | CO2 | L1 | 7M |
|  | b) | What are the different factors of safety used in the stability of infinite and finite slopes? Explain with the help of sketches. | CO2 | L1 | 7M |
|  |  | **Unit -III** | |  | L1 |
| 6. | a) | Determine the ultimate bearing capacity of the square footing 2m \* 2m in a soil with unit weight of 18kN/m3, phi = 200, c = 20kN/m2. Take the depth of foundation of 1.50 m. Use Terzaghi equation. N’c = 11.8, N’q = 3.9, N’γ = 1.7. | CO3 | L3 | 7M |
|  | b) | What is the purpose of structural foundation and write about different modes of shear failure of foundations. | CO3 | L1 | 7M |
|  |  | **(OR)** |  |  |  |
| 7. | a) | Explain plate load test with the help of a neat sketch and state its limitations. | CO3 | L1 | 7M |
|  | b) | Explain different methods to reduce differential settlements | CO3 | L1 | 7M |
|  |  | **Unit -IV** |  |  |  |
| 8. | a) | Explain different methods for the installations of piles | CO4 | L2 | 7M |
|  | b) | A 30 cm diameter concrete pile is driven into a homogeneous consolidated clay deposit (cu = 40kN/m2, α= 0.7). If the embedded length is 10 m, estimate the safe load (F.S = 2.5). | CO4 | L3 | 7M |
|  |  | **(OR)** |  |  |  |
| 9. | a) | Explain different shapes of well foundations | CO4 | L2 | 7M |
|  | b) | Explain Construction of Under Reamed piles in swelling soils. | CO4 | L2 | 7M |

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