**18CE603**

**Hall Ticket Number:**

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| **III/IV B.Tech (Regular/Supplementary) DEGREE EXAMINATION** | | | |
| **July, 2021** | **Civil Engineering** | | |
| **Sixth Semester** | **Foundation Engineering** | | |
| **Time:** Three Hours | | **Maximum: 5**0 Marks | |
| *Answer Question No. 1 Compulsorily.* | | | (10X1 = 10 Marks) |
| *Answer* ***ANY ONE*** *question from each Unit.* | | | (4X10=40 Marks) |

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| 1. | a) | What are disturbed and undisturbed samples? | CO1 | |  |
|  | b) | What is the inside clearance of sample if inside diameter of sampling tube and cutting edge is 32mm and 20mm respectively | CO1 | |  |
|  | c) | Define ‘Active Earth Pressure’ in earth pressure theories | CO2 | |  |
|  | d) | What is angular distortion of foundation | CO2 | |  |
|  | e) | Define Infinite slope | CO3 | |  |
|  | f) | What is the factory of safety of 150 dry infinite slope with φ=30o? | CO3 | |  |
|  | g) | Define safe bearing capacity of soil. | CO5 | |  |
|  | h) | Write the Terzaghi’s equation for ultimate bearing capacity of strip footing | CO5 | |  |
|  | i) | What is negative skin friction in construction of piles? | CO7 | |  |
|  | j) | . What are the different shapes of wells in well foundation? | CO8 | |  |
| Unit - I | | | | | |
| 2. | a) | Explain standard penetration test in detail | CO1 | **5M** | |
|  | b) | Write about wash boring with the help of neat sketch | CO1 | **5M** | |
|  |  | **(OR)** |  |  | |
| 3. | a) | Explain Rankine’s passive earth pressure theory for cohesion less soil. | CO2 | **5M** | |
|  | b) | A retaining wall is 4m high with its back vertical has got sandy backfill upto its top. The top of the fill is horizontal. Determine the passive earth pressure on the wall per metre length of the wall. Water table is 1m below the top of the fill. Dry density of soil=18.5 kN/m3. Moisture content of the soil above water table =12%. Angle of internal friction of the soil =300, specific gravity of soil=2.65. The wall friction may be neglected. Porosity of back fill= 30%. | CO2 | **5M** | |
| **Unit - II** | | | | | |
| 4. | a) | Explain the different types of slope failures with neat sketches | CO3 | **5M** | |
|  | b) | Explain total stress analysis (øu = 0) for analysing stability of slopes | CO3 | **5M** | |
|  |  | **(OR)** |  |  | |
| 5. | a) | A concentrated load of 40kN acts on the surface of the soil. Determine the vertical stress at 3m and 5m directly under the application of load and also on horizontal planes at 1m and 2m depth up to a horizontal distance of 3m on either side of the center as per Boussinesq’s theory. | CO4 | **5M** | |
|  | b) | Write a detailed note on New marks influence chart with a neat sketch | CO4 | **5M** | |
| **Unit - III** | | | | | |
| 6. | a) | What is a shallow foundation and what are the factors to be considered while designing the foundation | CO5 | **5M** | |
|  | b) | A square footing 2.5 mx 2.5 m is built in a homogenous bed of sand of unit weight 20kN/m3 and having an angle of shearing of 360.The depth of the base of the footing is 1.5m below the ground surface. Calculate the safe load that can be carried by a footing with a factor of safety of 3 against complete shear failure. Use Terzhagi’s analysis. (Nc= 65.4, Nq = 49.4, Nγ =54.0) | CO5 | **5M** | |
|  |  | **(OR)**  **P.T.O.**  **18CE603** |  |  | |
| 7. | a) | Explain the methods to reduce differential settlements in foundation | CO6 | **5M** | |
|  | b) | A strip foundation 1m wide is located at a depth of 0.8m below the ground surface. The properties of the foundation soil are: γ = 18kN/m3 , γsat = 19.5kN/m3 , c = 30kN/m2 and φ = 200. Determine the safe bearing capacity if the water table is located at the base of the footing using the factor of safety of 3. Use Terzaghi’s analysis. ( Nc’ = 11.8 , Nq’ = 3.9 , Nγ’ = 1.7 ) | CO6 | **5M** | |
| **Unit - IV** | | | | | |
| 8. | a) | Classify piles based on mode of load transfer and installation | CO7 | **5M** | |
|  | b) | Explain at least two dynamic formulae of piles. | CO7 | **5M** | |
|  |  | **(OR)** |  |  | |
| 9. | a) | Write a note on the components of a well foundation with neat sketch? | CO8 | **5M** | |
|  | b) | Explain different types of wells with neat sketch. | CO8 | **5M** | |

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