INSTITUTE OF AERONAUTICAL ENGINEERING
(Autonomous)

B.Tech VI Semester End Examinations (Regular), November– 2020

Regulation: IARE–R16

FOUNDATION ENGINEERING

Time: 2 Hours   **(CE)**   **Max Marks: 70**

Answer any Four Questions from Part A
Answer any Five Questions from Part B

PART – A

1. Explain the operation of stationary piston sampler. **[5M]**

2. Describe the phenomenon of sudden drawdown condition. **[5M]**

3. List out the assumptions of Rankine's earth pressure theory. **[5M]**

4. Describe the procedure for determining ultimate bearing capacity and settlement of foundation using plate load test. **[5M]**

5. Briefly explain the steps involved in the sinking process of wells. **[5M]**

6. Write down the equations for active and passive earth pressure coefficients. **[5M]**

7. How do we estimate negative skin friction in cohesive and cohesion less soils? **[5M]**

8. Write a detailed note on various types of boring techniques. **[5M]**

PART – B

9. State the objectives of soil exploration. Explain the wash boring method of soil exploration with a neat sketch. **[10M]**

10. A thin walled tube sampler having an external diameter of 5.8cm and a wall thickness of 2.5mm. Compute area ratio. Suggest whether the sampler can be used to obtain undisturbed soil sample. Why? **[10M]**

11. Describe the procedure to determine factor of safety of a soil slope using Swedish's circle method **[10M]**

12. A slope is to be constructed at an inclination of 30° to the horizontal. Determine the safe height of slope of 1.5, C=$1.5t/m^2$, ϕ=22.5^o, γ =$1.9t/m^3$. Stability numbers for mobilized friction angles are as follows

    For ϕ_m=22.5^o, S_n=0.02

    For ϕ_m=15^n, S_n=0.046

    $F_c = F_\phi = 1.5$ **[10M]**

13. Discuss the types of lateral earth pressures. Where do we use earth pressure theories? **[10M]**

14. Distinguish the Rankine's and Coulomb's theories for computation of earthpressure and suggest the suitability of these methods. **[10M]**

15. Describe the procedure for determining ultimate bearing capacity and settlement of foundation using plate load test. **[10M]**

16. Compute the safe bearing capacity of a continuous footing 1.8m , and located at a depth of 1.2m below ground level in a soil with unit weight γ =$20kN/m^3$, c=$20kN/m^2$, and ϕ =200. Assume a factor of safety 2.5. Terzaghi's bearing capacity factors for ϕ= 200 are N_c =17.7; N_q =7.4; and N_γ =5.0, what is the permissible load per meter run of the footing. **[10M]**

17. What are the remedial measures for rectification of tilts and shifts? **[10M]**

18. Draw a neat sketch of the cross-section of a well foundation. Explain its components. **[10M]**

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