

Code: CE6T6

III B.Tech - II Semester – Regular Examinations – April 2016

**GEOTECHNICAL ENGINEERING - II
(CIVIL ENGINEERING)**

Duration: 3 hours

Max. Marks: 70

Answer any FIVE questions. All questions carry equal marks

1. a) Discuss Standard penetration test. What are the various corrections? What is the importance of the test in Geotechnical engineering? 7 M

- b) Explain the need for soil exploration and Illustrate methods of it. 7 M

2. a) Describe Bishop's simplified method and state its advantages over conventional Swedish circle method. 7 M

- b) Determine the factor of safety with respect to cohesion, if an embankment of 20m height and having a slope of 45° is subjected to sudden drawdown.
 $C = 20 \text{ kN/m}^2$, $\phi = 30^\circ$, $\gamma_{\text{sat}} = 18 \text{ kN/m}^3$
(Take Taylor's stability number = 0.08) 7 M

3. a) State the assumptions made in Rankine's theory. Derive an expression for Active and Passive Pressure. 7 M

- b) A Retaining wall with a smooth back is 10m high. It supports a cohesionless soil ($\gamma = 19 \text{ kN/m}^3$, $\phi = 30^\circ$). The surface of the soil is horizontal. Determine the thrust on the wall. 7 M
4. a) Discuss the considerations to be made in the design of a Retaining wall. 7 M
- b) Discuss about the stability of a Cantilever Retaining wall. 7 M
5. a) State the assumptions made in the derivation Terzaghi's bearing capacity and give equation for the ultimate bearing capacity. 7 M
- b) Determine the ultimate bearing capacity of a strip footing 1.5m wide, with its base at a depth of 1m, Resting on a dry sand stratum, if the ground water table is located
- i) At a depth of 0.5m below the ground surface.
 - ii) At a depth of 0.5m below the base of footing.
- Take $\gamma_d = 17 \text{ kN/m}^3$, $\phi = 38^\circ$, $c' = 0$, $\gamma_{\text{sat}} = 20 \text{ kN/m}^3$. Use Terzaghi's theory ($N_q = 60$, $N_\gamma = 75$) 7 M
6. a) Describe different types of settlements which can occur in a foundation and how are these Estimated? 7 M

- b) Estimate the immediate settlement of a concrete footing, 1m x 2m size, founded at a depth of 1m in a soil with $E = 10^4 \text{ kN/m}^2$, $\mu = 0.3$. The footing is subjected to a pressure of 200 kN/m^2 . Assume the footing to be rigid. 7 M
7. a) Define 'Pile'. List out various types of pile foundations and explain each in detail. Give its uses. 7 M
- b) Describe the method for determining the load carrying capacity of a pile by Pile Load Test. 7 M
8. a) Discuss in detail about different shapes of wells and write characteristics of each type. 7 M
- b) List out various components of a well foundation and explain each in detail, also write their uses. 7 M