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BICE-012

B.Tech. CIVIL ENGINEERING (BTCLEVI)

Term-End Examination

December, 2015

BICE-012 : GEOTECHNICAL ENGINEERING – II

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt any **seven** questions. All questions carry equal marks. Assume missing data, if any. Use of scientific calculator is allowed.*

1. Compute the intensities of active and passive earth pressure at a depth of 8 metres in dry cohesionless sand with an angle of internal friction of 30° and unit weight of 18 kN/m^3. What will be the intensities of active and passive earth pressure, if the water level rises to the ground level ? Take saturated unit weight of sand as 22 kN/m^3. *10*

2. Discuss the following :

(a) Seismic refraction method

(b) Electrical resistivity method

When do you recommend the use of these tests in practice ? *10*

3. Distinguish between shallow and deep foundations. Explain the advantages and limitations of various types of foundations. *10*

4. What are the objectives of analysis of pile group ? State the principle of group action used for this analysis. *10*

5. A strip footing, 1 m wide at its base is located at a depth of 0·8 m below the ground surface. The properties of the foundation soils are γ = 18 kN/m^3, c = 30 kN/m^2 and ϕ = 20°. Determine the safe bearing capacity, using a factor of safety of 3. Use Terzaghi's analysis. Assume that the soil fails by local shear. For $\phi = 20°$, $N_{c'} = 11{\cdot}8$, $N_{q'} = 3{\cdot}9$ and $N_{\gamma'} = 1{\cdot}7$. *10*

6. (a) Explain the functions of foundation. *5*

   (b) Discuss the requisites of satisfactory foundations. *5*

7. Explain the Coulomb's and Rankine's earth pressure theories in detail. *10*

8. Discuss different methods of site investigation and soil exploration. *10*

9. Calculate the factor of safety with respect to cohesion of a clay slope laid at 1 in 2 to a height of 10 m, if the angle of internal friction is $\phi = 10°$, $c = 25\ kN/m^2$ and $\gamma = 19\ kN/m^3$. What will be the critical height of the slope in this soil ? *10*

10. Write short notes on any ***two*** the following : *2×5=10*

(a) Raft Foundation

(b) Floating Foundation

(c) Floating Caissons