

**B.TECH. CIVIL ENGINEERING
(BTCLEVI)**

Term-End Examination

June, 2014

00264

BICE-012 : GEOTECHNICAL ENGINEERING - II

Time : 3 hours

Maximum Marks : 70

Note : Attempt any seven questions. All questions carry equal marks.

1. Explain the Geophysical Methods of soil Exploration in brief. **10**

2. Compute the intensity of active and passive earth pressure at 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 intensity 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**

3. Define the following terms with reference to Bearing Capacity of soil : **10**
 - (a) Net Pressure Intensity
 - (b) Gross Pressure Intensity
 - (c) Ultimate Bearing Capacity
 - (d) Net Ultimate Bearing Capacity
 - (e) Net Safe Bearing Capacity

4. 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 soil are $\gamma = 18 \text{ kN/m}^3$, $C = 30 \text{ kN/m}^2$ and $\phi = 20^\circ$. 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 $\phi = 20^\circ$, $N'_c = 11.8$, $N'_q = 3.9$ and $N'_\gamma = 1.7$. 10
5. Define the shallow and deep foundations. Explain the probable pressure distribution beneath a rigid footing on a loose cohesionless soil and on cohesive soil with neat sketch. 10
6. Classify the piles based on the functions and discuss any four types of piles with neat sketch. 10
7. In a 16 pile group, the pile diameter is 45 cm and centre to centre spacing of the square group is 1.5 m. If $C = 50 \text{ kN/m}^2$, determine whether the failure would occur with the pile acting individually, or as a group? Neglect bearing at the tip of the pile. All piles are 10 m long. Take $m = 0.7$ for shear mobilisation around each pile. 10
8. Describe the procedure for sinking, the pneumatic caissons. 10

9. A rectangular footing $2\text{ m} \times 3\text{ m}$ carries a column load of 600 kN at a depth of 1 m . The footing rests on a $c-\phi$ soil strata 6 m thick, having Poisson's ratio of 0.25 and Young's modulus of elasticity as 20000 kN/m^2 . Calculate the immediate elastic settlement of the footing, for **10**

$$I_w = 1.06 \text{ and } \frac{L}{B} = 1.5, .$$

10. Write the short note on **any two** of the following : **2x5=10**

- (a) Negative Skin Friction
 - (b) Shapes of Wells
 - (c) Assumptions of the Coulomb's Wedge Theory
-