

**B.Tech. CIVIL ENGINEERING (BTCLEVI)****Term-End Examination****00443****December, 2018****BICE-012 : GEO-TECHNICAL 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 permitted.

---

1. An SPT is conducted in fine sand of 5 m thickness below a water table and a value of 35 is obtained for N. What is the corrected value of 'N' if the saturated unit weight of sand is  $24 \text{ kN/m}^3$  ? **10**
  
2. A soft normally consolidated clay layer is 18 m thick. The natural WC is 45%. The saturated unit weight is  $18 \text{ kN/m}^3$ , the grain specific gravity is 2.7 and the liquid limit is 63%. The vertical stress increment at the centre of the clay layer due to the foundation load is  $9 \text{ kN/m}^2$ . The groundwater table is at the surface of the clay layer. Determine the settlement of the foundation. **10**

3. A retaining wall 6 m high, retains dry sand with an angle of friction of  $30^\circ$  and unit weight of  $16.2 \text{ kN/m}^3$ . Determine the earth pressure at rest. If the water table rises to the top of the wall, determine the increase in the thrust on the wall. Assume the submerged unit weight of sand as  $10 \text{ kN/m}^3$ . 10
4. What is a caisson ? How are caissons classified based on the method of construction ? 10
5. Describe any one method of soil exploration. 10
6. Explain the circumstances under which a combined footing is used. When is raft foundation preferred ? 10
7. Describe the wedge theory for determining active earth pressure and evaluate the assumptions. 10
8. Explain different shear failure patterns of soil in shallow foundation. 10
9. How are skin friction and point resistance of a pile computed ? Explain the phenomenon, "Negative skin friction". 10

**10.** Write short notes on the following :

$$4 \times 2 \frac{1}{2} = 10$$

- (a) Active and passive earth pressure
  - (b) Safe bearing capacity and net bearing capacity of soil
  - (c) Causes of settlement
  - (d) Different types of foundations
-