

B.Tech. CIVIL ENGINEERING (BTCLEVI)

Term-End Examination

00293

June, 2018

BICE-012 : GEO-TECHNICAL ENGINEERING – II

Time : 3 hours

Maximum Marks : 70

*Note : Attempt any **five** questions. Use of scientific calculator is permitted.*

1. (a) Describe classification of samplers in brief. 7
- (b) Discuss in brief geophysical methods of soil exploration. 7
2. (a) Describe in brief, Coulomb's Wedge theory of earth pressure. 7
- (b) A vertical excavation was made in a clay deposit having unit weight of 22 kN/m^3 . It caved in after the digging reached 4 m depth. Calculate the magnitude of cohesion if $\phi = 0$. 7

3. (a) Describe the test procedure of the Standard Penetration Test.

7

(b) For a general $c-\phi$ soil, cohesion (c) is 50 kPa, the total unit weight γ_t is 20 kN/m³ and the bearing capacity factors are : $N_c = 8$, $N_q = 3$ and $N_\gamma = 2$. Using Terzaghi's formula, estimate the safe total load on a 10 m \times 2 m wide strip footing located at a depth of 1 m below ground. Take factor of safety as 3.

7

4. (a) Discuss the contact pressure distribution under a rigid footing and under a flexible footing. Give neat sketches in case of rigid footing.

7

(b) A normally consolidated clay settled by 2 cm when the effective stress was increased from 100 kPa to 200 kPa. Calculate the settlement when the effective stress is increased to (i) 400 kPa and (ii) 800 kPa.

7

5. (a) Discuss criteria for selection of a type of foundation with appropriate examples. 7
- (b) What is raft footing ? In what conditions is this footing best suited ? Mention design considerations for a raft footing. 7
6. (a) Give classification of piles based on the purpose/function. Give neat sketches also. 7
- (b) A reinforced concrete pile weighing 30 kN (inclusive of helmet and dolly) is driven by a drop hammer weighing 40 kN and having an effective fall of 0.8 m. The average set per blow is 1.4 cm. The total temporary elastic compression is 1.8 cm. Assuming the coefficient of restitution as 0.25 and a factor of safety of 2, determine the ultimate bearing capacity and the allowable load for the pile. 7
7. (a) What are the forces that act on a well foundation ? Write assumptions used in analysis of a well foundation. 7
- (b) Describe in brief, the well sinking operation. 7

8. Write short notes any *two* of the following : $2 \times 7 = 14$

- (a) Negative Skin Friction
 - (b) Effect of Water Table on Bearing Capacity
 - (c) Group Action in Piles
 - (d) Site Reconnaissance
-