

B.Tech. CIVIL ENGINEERING (BTCLEVI)

Term-End Examination

00825

December, 2014

BICE-012 : GEOTECHNICAL ENGINEERING – II

Time : 3 hours

Maximum Marks : 70

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

1. (a) Differentiate between disturbed and undisturbed sampling. 5
- (b) How do you decide the number and disposition of the test pits and borings for dam sites and road sites ? 5

2. Explain the procedure for Culmann's Graphical Method for Active Pressure. 10

3. Explain the Plate Load Test to determine the Ultimate Bearing Capacity of soil. 10

4. A square footing of size $2.5 \text{ m} \times 2.5 \text{ m}$ is built in a homogeneous bed of sand with unit weight 20 kN/m^3 and having an angle of shearing resistance of 36° . The depth of the base of footing is 1.5 m below the ground surface. Calculate the safe load that can be carried by a footing with a factor of safety of 3 against complete shear failure. Use Terzaghi's analysis. For $\phi = 36^\circ$, $N_c = 65.4$, $N_q = 49.4$ and $N_\gamma = 54.0$. 10
5. (a) Define the Combined footing and Strap footing. 3
 (b) Write the important points to be considered in designing of Mat footing. 7
6. (a) Discuss the types of Hammer used for Pile Driving. 5
 (b) Explain the static formulae for determining the load carrying capacity of a pile. 5
7. An n-pile group has to be proportioned in a uniform pattern in soft clay with equal spacing in all directions. Assuming any value of C, determine the optimum value of spacing of piles in the group. Take $n = 25$ and $m = 0.7$. Neglect the end bearing effect and assume that each pile is circular in section. 10
8. How will you select the depth of a well foundation? What are the forces acting on a well foundation? Explain them with a suitable sketch. 10

9. (a) What is the purpose of retaining wall? 2

(b) Draw neat sketches for Active and Passive states of Plastic Equilibrium. 8

10. Write short notes on any *two* of the following: $2 \times 5 = 10$

(a) Field Vane Shear Test

(b) Auger Borings

(c) Pneumatic Caissons
