

B.Tech. CIVIL ENGINEERING (BTCLEVI)

Term-End Examination

00204

June, 2017

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 allowed.*

1. What do you understand by active and passive earth pressure ? How will you calculate these in clay and sandy soil ? 10

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

3. A square footing 2.5 m by 2.5 m is built in a homogeneous bed of sand of 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 $N_c = 65.4$, $N_q = 49.4$ and $N_\gamma = 54.0$. 10
4. Differentiate between initial and final settlement. On what factors does the settlement of soil depend? 10
5. Define shallow and deep foundations. Explain the probable pressure distribution beneath a rigid shallow footing on a loose cohesionless soil and on a cohesive soil with a neat sketch. 10
6. Explain the construction details and design considerations of a well foundation. 10
7. Classify the piles based on the functions and discuss any four types of piles with a neat sketch. 10
8. In a 16 pile group, the pile diameter is 45 cm and centre to centre spacing of the piles in a 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

9. Describe the procedure for sinking the pneumatic caissons. 10

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

(a) Assumptions of the Coulomb's Wedge Theory

(b) Field Vane Shear Test

(c) Auger Borings
