

B.Tech. CIVIL ENGINEERING (BTCLEVI)

00545 Term-End Examination

June, 2019

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. Explain Rankine's theory of earth pressure.
Write limitations of Rankine's theory. 10
2. Explain different types of settlements of shallow foundation. 10
3. What is meant by bearing capacity of soil ?
Describe Terzaghi's theory of bearing capacity of shallow strip foundation. 10
4. Explain method of improvement of soil bearing capacity by sand drains. 10
5. Describe the major differences between SPT, SCPT and DCPT. 10

6. A strip footing 1.5 m wide, rests on the surface of a dry cohesionless soil having $\phi = 20^\circ$ and $\gamma = 19 \text{ kN/m}^3$. If the water table rises temporarily to the surface due to flooding, calculate the percentage reduction in the ultimate bearing capacity of the soil. Assume $N_\gamma = 5$. 10
7. A square group of 9 piles was driven into soft clay extending to a large depth. The diameter and length of the piles were 30 cm and 9 m respectively. If the unconfined compression strength of the clay is 90 kN/m^2 , and the path spacing is 90 cm centre to centre, what is the capacity of the group ? Assume a factor of safety of 2.5 and adhesion factor of 0.75. 10
8. What is the basis on which the dynamic formulas are derived ? Mention two well-known dynamic formulas and explain the symbols involved. 10
9. Discuss the different shapes of cross-section of wells used in practice, giving the merits and demerits of each. 10
10. Write short notes on the following : 2×5=10
- (a) Raft Foundation
- (b) Total and Differential Settlement
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