Reg. No. : | | | | | | | | | | |

Question Paper Code: 45102

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2019

Fifth Semester

Civil Engineering

14UCE502 - FOUNDATION ENGINEERING

(Regulation 2014)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

(IS 6403:1981, IS 8009 (Part 1):1976, IS 8009 (Part 2):1980 and IS 2911 (Part 1):1979 are permitted)

PART A - (10 x 1 = 10 Marks)

1. In soil samplers the area ratio should be greater than _____% for soft sensitive soil.

   (a) 22% (b) 23% (c) 24% (d) 25%

2. For seismic refraction method of soil exploration in which waves travel directly from the shock point along the ground surface and are picked up first by the geophone is.

   (a) primary waves (b) secondary waves
   (c) rayleigh waves (d) love waves

3. Expansion of SBC of soil is

   (a) Safe building capacity (b) safe boiling capacity
   (c) safe burying capacity (d) safe bearing capacity

4. Rise in water table in cohesion less soil up to ground surface reduces the net ultimate bearing capacity approximately by

   (a) 25% (b) 50% (c) 75% (d) 90%

5. Terzaghi's bearing capacity factors *Nc*, *Nq* and N_γ are functions of

(a) cohesion only (b) angle of internal friction only
(c) both cohesion and angle of internal friction (d) none of the above

6. Floating foundation is quite useful for

(a) sandy soils (b) clay soils
(c) very weak soils (d) strong soils

7. Under reamed piles are generally

(a) driven piles (b) bored piles (c) precast piles (d) all of the above

8. The group efficiency of driven pile in sand at a close spacing may be

(a) equal 100% (b) more than 100%
(c) 70% (d) 96%

9. Which of the following earth pressure theories is directly applicable to bulk-heads

(a) Rankines theory (b) Bernoulli's theory
(c) Kennedys theory (d) Darcy's theory

10. If the failure of a finite slope occurs through the toe, it is known as

(a) slope failure (b) face failure
(c) base failure (d) toe failure

PART - B (5 x 2 = 10 Marks)

11. When and why dilatancy correction applied to SPT N-Value?

12. Distinguish between Representative and Non- Representative samples.

13. Draw the contact pressure distribution diagram for flexible footing in clay.

14. What is meant by group settlement ratio?

15. Write the assumptions of Coulomb's Theory.

PART - C (5 x 16 = 80 Marks)

16. (a) Explain in detail, the different methods of boring carried out for soil exploration. (16)

Or

(b) (i) Write note on guide rules for the depth of exploration. (8)

(ii) Explain the types of sampler. (8)

17. (a) (i) Write the expression for a minimum depth of foundation for Rankine's analysis. (8)

(ii) What are the relation between ultimate bearing capacity, net ultimate bearing capacity, net safe bearing capacity and safe bearing capacity? (8)

Or

(b) A footing 3x3 m is founded in a deposit of medium dense sand at a depth of 1.5m below ground surface . the water table is at a depth of 0.5m below ground surface. The water table is at a depth of 0.5m below the ground surface. The soil investigation at the site indicate that an average SPT value of 14 may be taken which is corrected for overburden pressure and dilatancy. Compute the net allowable bearing pressure. (16)

18. (a) (i) Explain the different types of foundation. (8)

(ii) Draw and explain the types of spread footing with their pressure distribution. (8)

Or

(b) Discuss the various tests used for identification of expansive soils. (16)

19. (a) Explain the pile load test for determining the ultimate load carrying capacity of single vertical pile. (16)

Or

(b) Explain the method of determining the load carrying capacity of a pile. (16)

20. (a) The depths of soil behind and in front of a rigid retaining wall are 9m and 3m resp., both the soil surfaces are horizontal. The approximate shear strength parameters for the soil are Cu = 30KN/m^2 and $\Phi = 22^0$ and the unit weight is 20KN/m^3. Using Rankines theory , determine the total, active thrust behind the wall and the total passive resistance in front of the wall. (16)

Or

(b) (i) Explain Cullman's graphical method of earth pressure theory. (8)

(ii) Discuss about the stability of retaining walls. (8)