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Question Paper Code: 45102

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2021

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. The number and disposition of bore holes are varied, depending upon

   (a) Surroundings   (b) Strata   (c) Subsoil condition   (d) Ground water

2. The type of boring, used for making deep excavations is
   (a) Cylindrical augers   (b) Percussion boring
   (c) Rotary boring   (d) Wash boring

3. Which of the following is a type of shallow footing?
   (a) Spread footing   (b) Pile foundation
   (c) Pier foundation   (d) Well foundation

4. The Terzaghi's general bearing capacity equation is represented as

   (a) $qf = 5.7\ c + \bar{\sigma}$ (b) $qf = c\ Nc + \bar{\sigma}.\ Nq + 0.5\gamma BN\gamma$
   (c) $qf = c\ Nc + \bar{\sigma}.\ Nq$ (d) $qf = c\ Nc$

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. In raft footing, if the C.G of the load coincide with the centroid of the raft, the upward load is considered as

    (a) Non uniform pressure   (b) Uniform pressure

    (c) Excess pressure   (d) None of the mentioned

7. Enlarging the stem of bore hole at the depth, is done by using

    (a) Spiral auger   (b) Under-reamer

    (c) Boring guide   (d) None of the mentioned

8. The allowable load which the pile can carry safely is determined on the basis of

    (a) Factor of safety   (b) Load test

    (c) Stability of the pile foundation   (d) All of the mentioned

9. Rankine's theory of earth pressure assume that the back of the wall is

    (a) Plane and smooth   (b) Plane and rough
    (c) Vertical and smooth   (d) Vertical and rough

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

<center>PART - B (5 x 2 = 10 Marks)</center>

11. What are the parameters considered for selection of foundation?

12. Distinguish between Representative and Non- Representative samples.

13. In which circumstances you will select raft foundation?

14. Define swell potential.

15. How to check the stability of retaining wall?

<center>PART - C (5 x 16 = 80 Marks)</center>

16. (a) Discuss about the different types of foundation and their selection based on soil condition.   (16)

<center>Or</center>

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

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

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17. (a) Explain different types of shear failures of soil with neat sketch. (16)

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) Design of friction file group to carry a load of 3000 *kN* including the weight of the pile cap at a site where the soil is uniform clay to a depth of 20 *m*, underlain by rock. Average unconfined compression strength of clay is 70 *kN/m²* .The clay may be assumed to be of normal sensitive and normally loaded with liquid limit 60 *%*. A factor of safety of 3 required against share failure. (16)

20. (a) Explain plastic equlibrium in soil with active and passive states. (16)

Or

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

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

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