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Question Paper Code: 55012

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2017

Fifth Semester

Civil Engineering

15UCE502 - FOUNDATION ENGINEERING

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

- Thin walled sampler is used for _____ soils.
(a) soft clays (b) plastic silts
(c) very sensitive soil (d) all the above
- Standard Penetration Number (N) is equal to the number of blows required for _____ of penetration.
(a) 300mm (b) 30mm (c) 3000mm (d) 3mm
- Safe bearing capacity is the maximum intensity of loading that the soil carry without risk of _____ of soil.
(a) tensile failure (b) compressive failure
(c) shear failure (d) all the above
- Swelling potential of _____ soils is defined as the percentage swell of alaterally confined soil sample.
(a) red (b) expansive (c) sand (d) non-cohesive
- _____ are the type of the piles which are used to protect water front structures.
(a) Straight Piles (b) Bearing Piles
(c) Friction Piles (d) Fender Piles

6. The batter piles are used to resist large
- | | |
|----------------------------|------------------------------|
| (a) vertical upward forces | (b) vertical downward forces |
| (c) horizontal forces | (d) all the above |
7. _____ is called as angle of repose.
- | | |
|------------------------------|------------------------------|
| (a) Maximum natural slope | (b) Minimum natural slope |
| (c) Maximum artificial slope | (d) Minimum artificial slope |
8. Factor of safety against sliding should be atleast _____ for sandy soil.
- | | | | |
|---------|---------|---------|---------|
| (a) 0.5 | (b) 1.0 | (c) 1.5 | (d) 2.0 |
|---------|---------|---------|---------|
9. In well foundation, grip length is defined as the
- | |
|---|
| (a) depth of the bottom of the well below the maximum scour level |
| (b) depth of the bottom of the well below the minimum scour level |
| (c) length below the top of the well cap to the cutting edge |
| (d) length between the bottom of the well cap to the cutting edge |
10. The concrete slump recommended for foundations is
- | | |
|-------------------|-------------------|
| (a) 25 to 50 mm | (b) 50 to 100 mm |
| (c) 100 to 125 mm | (d) 125 to 150 mm |

PART - B (5 x 2 = 10 Marks)

11. What are called representative and non-representative samples?
12. List the factors affecting bearing capacity of soil.
13. Define group efficiency of pile.
14. Compare Rankine's and Coulomb's theory.
15. List the various components of settlement.

PART - C (5 x 16 = 80 Marks)

16. (a) (i) What are the objectives of soil exploration? (8)
- (ii) What are the steps involved in soil exploration? (8)

Or

- (b) (i) Explain in detail the geophysical methods of soil explorations with neat sketch. (8)

- (ii) Write short notes on standard penetration test. (8)
17. (a) (i) Explain in detail the various types of shear failure. (4)
- (ii) Explain plate load test with required sketch. (12)

Or

- (b) (i) What is meant by allowable settlement? How to determine immediate settlement of foundation on clay? (8)
- (ii) Discuss about the methods of minimizing settlement and differential settlement. (8)
18. (a) (i) Briefly explain static and dynamic formulae of load carrying capacity of piles. (4)
- (ii) In a load test conducted at a depth of 1 meter below ground with a square plate of 30cm side on a granular soil, load required to cause 25mm settlement was 72 kN. Find out the size of a square column footing which will be having its base at a depth of 2.5 m below ground level and is required to take a load of 1750kN. The settlement of the footing is restricted to be 10mm only and factor is to be 3 only. Unit weight of soil 19kN/m^3 . $N_c = 12$ and $N_r = 6$. (12)

Or

- (b) (i) Explain the under reamed pile foundation with neat sketch. (12)
- (ii) Explain about negative skin friction. (4)
19. (a) Explain Rankine's theory for the cases of cohesion less backfill. (16)

Or

- (b) Explain with neat sketch the Rebhann and Culmann's method of calculating active earth pressure. (16)
20. (a) Explain in detail about data requirements, forces acting, choice of foundation type for designing foundations of transmission line towers. (16)

Or

- (b) (i) Describe about types of caissons with neat sketches. (6)
- (ii) Explain the various remedial measures for settlement of foundation. (10)

