Reg. No. : ☐☐☐☐☐☐☐☐☐☐

Question Paper Code: 35012

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

Fifth Semester

Civil Engineering

01UCE502 – FOUNDATION ENGINEERING

(Regulation 2013)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. What is a representative sample?

2. Differentiate between disturbed samples and undisturbed samples.

3. What is tolerable settlement?

4. What do you mean by differential settlement and how to minimize it?

5. State the situations under which the raft foundation is adopted.

6. Define floating foundation.

7. How is the efficiency of pile group calculated?

8. List out the types of piles based on materials and based on erection.

9. Differentiate between active earth pressure and passive earth pressure.

10. What is unsupported vertical height in cohesive soil?

PART - B (5 x 16 = 80 Marks)

11. (a) Explain wash boring method with neat sketch. Also explain how depth of boring and spacing of borehole is decided. (16)

Or

(b) Explain with sketch how standard penetration test is conducted. Also explain the corrections to be carried out to the observed N value. (16)

12. (a) A clayey layer of 2.5 m thick is sandwiched between sandy layers at 12 m below the ground level. Determine the consolidation settlement of footing 1.8 x 1.8 m at 1.8 m below ground level carrying 700 kN load. Unit weights of sand and clay are 18 kN/m^3 and 21 kN/m^3 respectively. Moisture content and liquid limit of clay are 35% and 48% respectively. Water table is at the top of clay layer and is 12 m below the ground level. (16)

Or

(b) Explain the factors affecting bearing capacity of soils . (16)

13. (a) Explain the factors governing the selection of the types of foundations. (16)

Or

(b) A raft foundation 10 m wide and 12 m long is to be constructed in a clayey soil having shear strength of 12 kN/m^2. Unit weight of soil is 16 kN/m^2. If the ground surface carries a surcharge of 20 kN/m^2 calculate the max depth of foundation to ensure a factor of safety of 1.2 against base failure, Nc =5.7. (16)

14. (a) A group of 9 piles arranged in a square pattern with diameter and length of each pile as 25 cm and 10 m respectively, is used as s foundation in soft clay deposit. Taking the unconfined compressive strength of the clay as 120 kN/m^2 and the pile spacing as 100 cm centre to centre. find the load carrying capacity of the group and group efficiency. Assume the bearing capacity factor Nc = 9 and cohesion factor = 0.75.A factor of safety of 2.5 may be taken. (16)

Or

(b) Describe in detail about the pile load tests with neat sketch, also discuss about cyclic load test and draw load penetration curve. (16)

15. (a) Derive the expression for active earth pressure for cohesive backfill. Also draw the pressure distribution diagram and explain the salient features. (16)

Or

(b) A smooth vertical wall of height 4 m, retains a cohesion less backfill with an angle of internal friction of $30°$, void ratio of 0.62 and specific gravity of solids is 2.7. Draw the active earth pressure distribution diagram if the soil is (a) dry (b) saturated (c) submerged. (16)

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