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Question Paper Code : 41007

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2013.

Fifth Semester

Civil Engineering

080100029 — FOUNDATION ENGINEERING

(Regulation 2008)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is meant by significant depth of exploration? State the minimum depth of exploration for pile foundations.

2. What are representative and non-representative samples?

3. Specify the equation for minimum depth of foundations as per Rankine's analysis.

4. Define safe bearing capacity of the soil.

5. Differentiate shallow foundation from deep foundations.

6. Under what circumstances mat foundations are used.

7. What are under reamed piles? Specify its use.

8. Write the formula of converse Labarre to find the pile group efficiency.

9. State the assumptions made in Rankine's earth pressure theory.

10. State the assumptions made in Coulomb's Wedge theory.

PART B — (5 × 16 = 80 marks)

11. (a) Explain with neat sketches the open excavations and boring methods of exploration of soil.

Or

(b) Explain with neat sketches of any three types of samplers.

12. (a) (i) A strip footing, 1 m wide at its base is located at a depth of 0.8 m below the ground surface. The properties of the foundation soil are : $\gamma = 18\,\text{kNm}^3$, $c = 30\text{kN/m}^2$ and $\phi = 20°$. Determine the safe bearing capacity using a factor of safety of 3. Use Terzaghi's analysis. Assume that the soil fails by local shear. For $\phi = 20°$, N_c' and N_q', and N_γ', are 11.8, 3.9 and 1.7 respectively. (8)

     (ii) Determine the depth at which a circular footing of 2 m diameter be founded to provide a factor of safety of 3, if it has to carry a safe load of 1600 kN. The foundation soil has $\gamma = 18kN/m^3, c = kN/m^2\ and\ \phi = 30°$. Use Terzaghi's analysis. (8)

Or

(b) Briefly explain the testing procedure, use advantages and limitations of Plate Load Test with a neat sketch.

13. (a) (i) Explain with neat sketches the various types of foundations. (8)

     (ii) Draw and explain the contact pressure distribution below rigid footings on cohesive and non-cohesive deposits. (8)

Or

(b) Write short notes on :

     (i) Floating foundations (5)

     (ii) Combined footing (5)

     (iii) Foundations on expansive soils. (6)

14. (a) (i) Give a brief account on 'Negative Skin Friction'. (8)

     (ii) How piles are ground? List the piles that are grouped based on their function (load transfer) with neat sketches. (8)

Or

(b) (i) Explain the pile load test with a neat sketch.

     (ii) Write a short note on, the following with their limitation.

        (1) Engineering News formula

        (2) Hileys formula

        (3) Felds-Rule

        (4) Static formula for cohesive soil.

15. (a) Explain the Culmann's graphical method for evaluating the active earth pressure. Also justify its application on account of line loads running parallel to the retaining walls.

Or

(b) Briefly explain the Coulomb's Wedge theory and the determination of active earth pressure.

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