Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐☐

Q 2125

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2007.

Sixth Semester

Civil Engineering

CE 340 – FOUNDATION ENGINEERING

Time : Three hours   Maximum : 100 marks

(Use of I.S. 6403 is permitted)

Use of I.S. 456 is permitted.

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define inside clearance, out side Clearance in sampling tube.

2. What are the objectives of site investigation?

3. What are the methods of minimizing settlement?

4. What are the types of shear failure in foundation?

5. Draw the pressure distribution diagram for flexible and rigid footing for cohesive soil.

6. What is the maximum allowable settlement in raft foundation for both clay and sand?

7. Why settlement of pile is restricted to 12mm when the settlement allowed higher in Shallow foundation?

8. A drop hammer weight 25KN free fall of 1.0m is used to drive the pile. Find the load carrying capacity of pile using Engineering news formula. If the penetration in last blow is 5mm.

9. Discuss the variation of earth pressure with wall movement.

10. What are the assumptions in Rankine's theory?

PART B — (5 × 16 = 80 marks)

11. (a) What are the types of soil samples and samplers and describe any one of the soil sampler? (8 + 8)

Or

(b) (i) Explain the wash boring method in the soil exploration program. (10)

(ii) What are the corrections to be applied in SPT "N" values? (6)

12. (a) (i) Under what circumferences the different types of shallow footings are preferred and explain. (8)

(ii) What are the general requirements of foundation and explain it briefly? (8)

Or

(b) Calculate the net ultimate bearing capacity if a rectangular footing of size 2 × 4 m laid at a depth of 1.5m below ground level. The load on the footing act at an angle of 15° to the vertical and if eccentric in the direction of width by 15cm. The saturated unit weight of soil is $18 kN/m^3$. Rate of loading will be slow and hence the effective shear strength parameter can be used in the analysis. $C' = 15 kN/m^2$, $\phi = 25°$. Natural water table at a depth 2m below the ground surface. Nc = 20.7, Nq=10.7, Nγ = 10.9. Use IS 6403-1981 recommendations. (16)

13. (a) Explain the steps involved in the proportioning of footing. (16)

Or

(b) Design a square reinforced concrete footing of column of load 1000KN, Allowable Soil pressure $250 kN/m^2$. Size of column is 0.5m × 0.5m. Draw the reinforcement Details. (16)

14. (a) Describe briefly the procedure of pile load and plate load tests, along with their advantages and disadvantages. (16)

Or

(b) (i) Determine the safe load carrying capacity of pile group consist of 9-friction pile of 30cm diameter and 12m lengths driven in soft clay. Cu = 125 kN/m^2, γ_{sat} = 20 kN/m^3, factor of safety is 3, α = 0.6. (8)

(ii) Write the limitations of dynamic formula in finding load carrying capacity. (8)

Q 2125

15. (a) A smooth vertical wall of 4.5m high, retain a soil with $C' = 25 \text{ kN/m}^2$, $\gamma = 18 \text{ kN/m}^3$. The horizontal back fill surface carries a uniform surcharge load $50 KN/m^2$. The retaining wall is tend to move towards the soil. Draw the pressure distribution diagram and determine the magnitude and point of application of total pressure. (16)

Or

(b) Explain briefly the procedure to find active earth pressure using Culman's method. (16)