[H 11387]

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2006.

Sixth Semester

Civil Engineering

CE 340 — FOUNDATION ENGINEERING

Maximum : 100 marks

Time : Three hours

Answer ALL questions.

PART A — ($10 \times 2 = 20$ marks)

1. Explain representative and non-representative samples.

2. Define chunk sample.

3. Compare general shear and local shear failure.

4. What is meant by allowable settlement?

5. When you provide strap footing?

6. Name the different types of raft.

7. Define the term 'negative skin friction'.

8. What is the use of batter pile?

9. Brief the assumption in Coulomb's wedge theory.

10. Retaining walls are usually designed for active earth pressure. Why?

PART B — ($5 \times 16 = 80$ marks)

11. (i) Briefly explain the conventional method of analysis of raft foundation. (8)

(ii) Explain the design aspects of trapezoidal combined footing. (8)

(8 + 8 = 16)

12. (a) Briefly explain :

(i) Seismic method of soil exploration

(ii) Static cone penetration test.

Or

(b) (i) Briefly explain standard penetration test. (8)

(ii) Write short notes on selection of foundation based on soil conditions. (8)

13. (a) An R.C.C. column has a square footing founded at a depth of 2.4 m below ground level on a clayey stratum of average density 18 kN/m^3 and shearing strength 40 kN/m^2. The total load applied to the soil is 850 kN. Calculate the dimensions of the footing assuming a factor of safety 2.5. (16)

Or

(b) (i) Explain the effect of water-table on bearing capacity. (8)

(ii) Compute the settlement of a rigid footing 2.6 m × 2.6 m carrying a load of 1800 kN, supported on a sandy soil, if a plate load test gives a settlement of 8 mm under a load of 320 kN/m^2. Size of plate 30 cm × 30 cm. (8)

14. (a) (i) Describe precast concrete piles with their merits and demerits. (8)

(ii) What do you understand by under-reamed piles and what situations dictate their use? (8)

Or

(b) A group of 16 friction piles is to support a column load of 4000 kN. The piles will be driven in four rows with four numbers in each column. The piles are of 35 cm dia. and the centre-to-centre spacing is 1 m both ways. What set value must be attained by the piles when driven by a single acting 22.5 kN steam hammer with 90 cm stroke so that the pile group can carry the column load. (16)

15. (a) Discuss briefly, how active pressure could be obtained by Coulomb's Wedge theory, using Culmann's method for walls with inclined backs and supporting soils with inclined top surface. How will you fix the direction of the resultant? (16)

Or

(b) A retaining wall with a vertical back retains 5 m to non cohesive coarse material having level surface at the top. The water level stands at a depth of 2.5 m below the top. The unit weight of the saturated weight of material above the water table is 18 kN/m^3. The angle of wall friction is 14.5° and corresponding co-efficient of active pressure is 0.23. Calculate the resultant force acting on the base of the wall and indicate the direction in which it acts. γ_{sat} of sand below water table is 20 kN/m^3. (16)
