C 3115

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2007.

Fifth Semester

(Regulation 2004)

Civil Engineering

CE 1305 — FOUNDATION ENGINEERING

(Common to B.E. (Part-Time) Fourth Semester Regulation 2005)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is a Disturbed Sample?

2. What is significant depth?

3. What is net pressure intensity?

4. What is safe bearing capacity?

5. What is a Combined Footing?

6. What is a Mat Foundation?

7. In what situation the friction piles are used?

8. What is meant by Negative Skin Friction?

9. What is the use of a retaining wall?

10. What is called as Surcharge?

PART B — (5 × 16 = 80 marks)

11. (a) Explain any two methods of site exploration in detail. (16)

Or

(b) Explain any two important types of samplers. (16)

12. (a) (i) A square footing 2.5 m by 2.5 m is built in a homogeneous bed of sand of unit weight 20 kN/m^3 and having an undrained cohesion C_u = 250 kN/m^2. The depth of the base of footing is 1.5 m below the ground surface. Calculate the safe load that can be carried by a footing with a factor of safety of 3 against complete shear failure. Use terzaghi's analysis. (8)

(ii) Indicate the allowable settlement of an isolated and raft foundation in clayey and sandy deposits. (8)

Or

(b) Brief the procedure of calculation of elastic and consolidation settlement. (16)

13. (a) A raft foundation 10 m wide and 12 m long is to be constructed in a clayey soil having a shear strength of 12 kN/m^2. Unit weight of soil is 16 kN/ m^3. If the ground surface carries a surcharge of 20 kN/m^2, calculate the maximum depth of foundation to ensure a factor of safety of 1.2 against base failure. N_c for clay is 5.70. (16)

Or

(b) A trapezoidal footing is to be produced to support two square columns of 30 cm and 50 cm sides respectively. Columns are 6 metres apart and the safe bearing capacity of the soil is 400 kN/m^2. The bigger column carries a load of 500 kN and the smaller carries a load of 3000 kN. Design a suitable size of the footing so that it does not extend beyond the face of the columns. (16)

14. (a) Explain the methods of determining the load carrying capacity of a pile. (16)

Or

(b) Explain the various stages involved in the construction of under-reamed pile foundation. (16)

15. (a) Explain for the following cases, the analysis of earth pressure distribution on a smooth, vertical and rigid retaining wall.

(i) Submerged backfill and

(ii) Backfill with uniform surcharge.

Or

(b) Explain the active and passive states of earth pressures acting on a retaining wall. (16)
