Reg. No. : ☐☐☐ - ☐☐☐☐☐☐☐

Question Paper Code : 31209

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

Fifth Semester

Civil Engineering

CE 2305 / CE 54/ 10111 CE 505 — FOUNDATION ENGINEERING

(Regulation 2008 / 2010)

(Common to PTCE 2305 – Foundation Engineering for B.E. (Part – Time) Fifth Semester Civil Engineering – Regulation 2009)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1.   What is meant by inside clearance and outside clearance? What is its use?

2.   List the field tests commonly used in subsurface investigation.

3.   What are the major criteria to be satisfied in the design of a foundation?

4.   What is the effect of rise of water table on the bearing capacity and the settlement of a footing on Sand?

5.   Draw the centac pressure distribution of rigid footing founded on clay and sand deposits.

6.   List the different type of raft foundation. Which type of raft is commonly used? Why?

7.   How piles are classified based on method of installation?

8.   What are the limitations of the dynamic pile load formula?

9.   Why are retaining walls usually designed for active pressure?

10. What is meant by the critical depth of vertical cut for a clay soil?

PART B — (5 × 16 = 80 marks)

11. (a) Explain with neat sketches about SPT and SCPT. (16)

Or

(b) With neat sketches briefly discuss seismic method and electric resistivity method of soil exploration. (16)

12. (a) Brief the plate load test conducted to determine the bearing capacity and settlement with neat sketches. (16)

Or

(b) A footing 3 m square, is founded at a depth of 2 m in a sand deposit, for which the correct value of N is 30. The water table is at a depth of 3 m from the surface. Determine the net allowable bearing pressure using Teng's equation, if the permissible settlement is 40 mm and factor of safety of 2 is desired against shear failure. (16)

13. (a) Describe the procedure of design of trapezoidal footing. (16)

Or

(b) Design a rectangular combined footing for two columns 6 m(c/c) apart. The exterior column size is 0.5×0.5 m and it carries 1500 kN load. The interior column is of size 0.3×0.3 m and it carries a load of 1000 kN. The projection of footing beyond left column is 0.7 m from centre and 1.8 m beyond right side column centre take allowable soil pressure as 200 kN/m^2. (16)

14. (a) Explain with neat sketches about pile load test method of determination of load carrying capacity of piles. (16)

Or

(b) Determine the group efficiency of a pile group consists of 16 piles of each 20 m long and diameter with c/c distance on both directions equal to 1.0 m which are embedded on a clay deposit having cohesive strength of 35 kN/m^2 by static method, Feld's rule and converse Labara formula. Take adhesion factor as 0.6. (16)

15. (a) Check the stability of a cantilever retaining wall of smooth vertical back of 6 m height and 0.2 m thick at top and 0.3 m at bottom. The foundation base of retaining wall of depth 0.6 m projected on the left side of 0.5 m and 2.0 m on the right side. It supports a sandy back fill with unit weight 18 kN/m^3 leveled to the top of wall. The angle of internal friction of soil is $34°$. Use Rankine theory. (16)

Or

(b) What are the different method of soil stabilization? Explain with neat sketches. (16)