Question Paper Code : 51240

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2014.

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 are the importance of site investigation?
2. How the depth of bore hole is decided for various projects?
3. What is ultimate bearing capacity?
4. What is net pressure intensity?
5. What is spread footing?
6. State the expression for the total settlement of a footing.
7. What are friction piles?
8. When does negative skin friction occurs in piles?
9. What is surcharge angle?
10. What is earth pressure at rest?

PART B — (5 × 16 = 80 marks)

11. (a) Explain various types of samples. Also discuss various factors affecting quality of samples.

Or

12 (b) Explain in detail the standard penetration test. State also the corrections to be applied on the observed SPT 'N' value.

12. (a) Explain the plate load test to determine the bearing capacity of soil. (16)

Or

(b) Determine the depth at which a circular footing of 3m diameter be found to provide a factor of safety of 3, if it has to carry a safe load of 1500kN. The foundation soil has $c = 10$ kN/m², $\gamma = 18$ kN/m³. Use Terzaghi's analysis.

13. (a) Explain the conventional method of design of raft foundation. (16)

Or

(b) Explain the design procedure of Trapezoidal combined footing. (16)

14. (a) Explain the pile load test to determine the load carrying capacity of pile.

Or

(b) In a 16 pile group, the pile diameter is 45 cm and center to center spacing of the piles in a square group is 1.5 m. If $c = 50$ kN/m², determine whether the failure would occur with the pile acting individually, or as a group? Neglect bearing at the tip of the pile. All piles are 10m long. Take $m = 0.70$. For shear mobilisation around each pile.

15. (a) A smooth vertical retaining wall 8m high retains a cohesive soil. The surface is level with the top of the wall and it carries a uniform pressure intensity of 20 kN/m². The unit weight of the soil is 16 kN/m³. The soil has cohesion of 50 kN/m² and angle of internal friction of 10°. Determine Rankine's total active earth pressure acting on the wall. (16)

Or

(b) Explain the Coulomb's wedge theory of earth pressure with a neat sketch.