C 22572
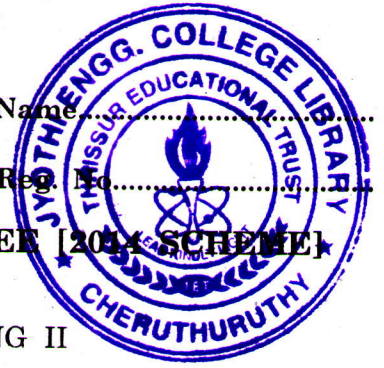
(Pages : 2)

SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2014 SCHEME] EXAMINATION, APRIL 2017

CE 14 605—GEOTECHNICAL ENGINEERING II

Time : Three Hours   Maximum : 100 Marks

Part A

Answer any **eight** questions.

1. Draw the contact pressure distribution beneath the flexible and rigid footings for sand and clay.

2. Sketch the types of augers used in soil exploration.

3. What are the requirements of selection of various types of foundation ?

4. Mention the types of shear failures of soil with neat sketch.

5. What are the causes of settlement ?

6. How does stress distributions takes place in sheeting and bracing of shallow excavations.

7. Write down the salient features of a good sub-soil investigation report.

8. Brief about the concept of floating foundation.

9. What are the various factors influencing the selection of pile ?

10. What are the various kinds of forces likely to act on a well foundation ?

(8 × 5 = 40 marks)

Part B

Answer **all** questions.

11. (a) What are the basic assumptions in Boussinesq's theory of stress distribution in soils ? Explain the vertical stress distribution on a horizontal plane as well as on a vertical plane.

Or

(b) Describe the Standard Penetration Test used in soil exploration. Explain the various corrections to be applied to the observed value of N.

12. (a) Distinguish between Shallow and Deep foundation. Explain the types of foundation.

Or

(b) Derive Terzaghi's bearing capacity equation of strip footing.

Turn over

13. (a) A saturated soil has a compression index of 0.25. Its void ratio at a stress of 10 kN/m^2 is 2.02 and its permeability is 3.4×10^{-7} mm/s. Compute (i) Change in void ratio if the stress is increased to 19 kN/m^2 ; (ii) Settlement if the soil stratum is 5 m thick and (iii) Time required for 40% consolidation if drainage is one-way.

Or

(b) When is a trapezoidal combined footing preferred to rectangular combined footing? Explain how they are proportioned.

14. (a) Explain the conventional rigid approach method of design of a raft foundation.

Or

(b) A square group of 9 piles was driven into soft clay extending to a large depth. The diameter and length of the piles were 30 cm and 9 m respectively. If the unconfined compression strength of the clay is 90 kN/m^2 and the pile spacing is 90 cm centre to centre, what is the capacity of the group ? Assume a factor of safety of 2.5 and adhesion factor of 0.75.

(4 × 15 = 60 marks)