CE - 604

B.E. VI Semester

Examination, June 2013

Geotechnical Engineering - I

Time : Three Hours

Maximum Marks : 100 ***Min. Pass Marks : 35***

Note: Total number of questions 10. Attempt one question (including all parts) from each unit. Assume missing data, if any suitably.

Unit - I

1. a) What is a unit phase diagram? Explain with examples.
   b) How is the plasticity chart useful for classifying fine-grained soils?

OR

2. A compacted cylindrical specimen 50 mm in diameter and 100 mm long is to be prepared from dry soil. If the specimen is required to have a water content of 15%, find the percentage of air voids required in the preparation of the soil when the specific gravity is 2.69.

Unit - II

3. a) What are the various parameters that affect the permeability of soil in the field? Critically discuss.
   b) In a falling head permeability test, head causing flow was initially 50 cm and it drops 2 cm in 5 minutes. How much time required for the head to fall to 25 cm.

OR

4. Explain with suitable analogy Terzaghi's theory of one-dimensional consolidations of soils.

Unit - III

5. a) Explain the concept of 'pressure bulb' in soils.
   b) Write a brief critical note on 'Newmark influence chart'.

OR

6. What are the three standard triaxial shear tests with respect to drainage conditions? Explain with reasons the situations for which each test is to be preferred.

Unit - IV

7. a) Explain the various causes of the failure of earth slopes.
   b) Write critical notes on the friction circle method of analyzing the stability of slopes.

OR

8. Explain the method of slices for stability analysis of slopes.

Unit - V

9. Derive a general expression for active earth pressure by the wedge theory behind a vertical wall due to cohesion less soil with a level surface.

OR

10. Write short notes on any four of the following :
    a) Coefficient of passive earth pressure.
    b) Critical void ratio.
    c) Degree of consolidation
    d) Partially saturated soil
    e) Darcy's law
    f) Activity of clays.

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