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CE - 604**B.E. VI Semester**

Examination, June 2017

Geo Technical Engineering - I**Time : Three Hours****Maximum Marks : 70**

Note: i) Answer any five questions.
 ii) All questions carry equal marks.

1. A soil has liquid limit and plastic limit of 47% and 33% respectively. If the volumetric shrinkage at the liquid limit and plastic limit are 44% and 29%. Determine the shrinkage limits.
2. A clay layer 4m thick is subjected to a pressure of 55kN/m². If the layer has a double drainage and undergoes 50% consolidation in one year. Determine the coefficient of consolidation. Take $T_v = 0.196$. If the coefficient of permeability is 0.20m/year. Determine the settlement in one year and rate of flow of water/unit/area.
3. Define the following terms:
 - a) Coefficient of compressibility.
 - b) Primary consolidation and secondary consolidation.
 - c) Time-settlement curve.
 - d) Coefficient of consolidation.

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4. A falling head permeability test was performed on a sample of clean uniform sand one minute was required for the initial head of 100cm to fall to 50cm in the stand pipe of the cross-sectional area 1.50 cm². If the sample was 4cm in diameter and 30cm long. Calculate the coefficient of permeability of the sand.

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5. A sample of dry sand was subjected to a triaxial test with a confining pressure of 250kN/m². The angle of shearing resistance was founded to be 36°. At what value of the major principal stress, the sample is likely to fail?
6. Determine the factor of safety with respect to shear strength of a slope 10m high and having an inclination of 40° of a soil with $C = 30\text{kN/m}^2$ and ϕ is 10° $\gamma = 19\text{kN/m}^3$.
7. What is a stability number? What is its utility in the analysis of stability of slopes? Discuss the uses of stability charts.
8. Answer any four of the following:
 - a) Explain the difference between the coefficient of compressibility and the compression index.
 - b) What is Darcy's law? What are its limitations?
 - c) Explain direct shear test. What are its merits and demerits?
 - d) Define earth pressure at rest. Show the earth pressure distribution on a retaining wall, assuming the soil is dry.
 - e) Explain the Trial Wedge method.
 - f) What are different types of earth pressure?

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