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Total No. of Questions : 5]

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**EG-312**

**B.E. VII Semester (CGPA) Civil Engg.**  
**Examination 2018**

**GEOTECHNICAL ENGINEERING-I**

**Paper - CE-703**

*Time Allowed : Three Hours]*

*[Maximum Marks : 60*

- Note :**
- i) All questions are to be attempted.
  - ii) All questions carry equal marks.
  - iii) There is internal choice in each question.
  - iv) Assume suitable data if necessary.

- Q.1.**
- a) Discuss influence of Clay minerals on engineering properties of Soil.
  - b) What are important index properties? Explain any one, with experimental details and its use.

**OR**

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- c) What are Consistency Limits? Give their importance and method of determination of any one of them.
- d) Explain method of classification based on particle size distribution. How it is carried out for fine particles?

- Q.2. a) Describe various methods of finding permeability of soils in laboratory. Give advantages of one over other and conditions of their suitability.
- b) What are Flownets? Give their uses and methods of obtaining same.

OR

- c) What are assumptions in Terzaghi's theory of one dimensional consolidation? Discuss their validity.
- d) An undisturbed sample of clay stratum 2m thick was tested in laboratory and average value of coeff. of consolidation was found to be  $2 \times 10^{-4}$  cm<sup>2</sup>/sec. If the structure is built on the clay how long will it take to attain half the ultimate settlement under the load of structure. Assume double drainage.

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- Q.3. a) How many types of shear test can be performed in triaxial testing machine depending upon the drainage conditions. Give procedure to measure pore pressure.
- b) Draw a neat sketch of box shear test and give its advantages and disadvantages over triaxial testing.

OR

- c) Explain unconfined compression testing of soil with neat sketch. Give advantages of the test.
- d) A cylinder of soil fails under axial vertical stress of  $16 \text{ tons/m}^2$  when it is laterally unconfined. The failure plane makes an angle of  $50^\circ$  with the horizontal. Calculate values of shear parameters.

- Q.4. a) Explain stability analysis of infinite slopes for cohesive soils and cohesionless soils.
- b) What is Stability Number? How it is determined? Give its use.

OR

(4)

- c) Explain Swedish circle method step by step giving its assumptions for C- $\phi$  soils.
- d) Explain steps in friction circle method for slope analysis with neat sketch.

- Q.5. a) Explain limitations of Rankine and Coulomb's earth pressure theories.
- b) Explain Culmann's method for analysis of cohesionless soils.

OR

- c) Explain Reinforced earth retaining walls and its construction.
- d) Explain effect of surcharge load and how it is accounted for in graphical construction analysis.

