ROLL No.........

FIFTH SEMESTER B.Tech. (CIVIL ENGG)
END SEMESTER EXAMINATION *FEB 2019*
CE-307 ADVANCED GEOTECHNICAL ENGINEERING

Time: 3 Hours   *Max. Marks : 40*

> Note: ATTEMPT ANY FIVE QUESTIONS.ASSUME THE MISSING DATA IF ANY.

1. a. Define double layer. How its thickness is determined. (4)

   b. Explain the fabric study by use of following techniques
      (i)SEM analysis   (ii) Differential thermal technique (4)

2.a.Discuss pump out method for finding permeability of the soil. (4)

   b. What are the factors affecting base-exchange capacity of the soil. Determine the base- exchange capacity of clay if 100gm of dry clay soil absorbs 90 gm of calcium. Find the quantity of H that can be absorbed by 6 m^3 of this clay if the bulk density of clay is 19 KN/m^3 and water content of the soil is 14%. (4)

3.a.Derive the relation for K_u and K_β (permeabilities in m and n directions respectively) in terms of K_h and K_v (permeabilities in horizontal and vertical directions respectively). (4)

   b. Discuss how the strength of the soil is improved by electro osmosis process. (4)

4.a. How the seepage through zoned dam is estimated. Discuss Pavlosky's solution. (4)

   b.Write a note on the seepage in layered soils. (4)

4.a. Explain the mechanism of shear strength. (4)

   b. The equation of Mohr's envelope is given by $T^2 = \sigma + 16$ (kg/cm^2).Find the unconfined compressive strength, torsional shear strength and tensile strength . (4)

5. a .Differentiate NCC and OCC. Explain how pre consolidation pressure is determined. (4)

   b. Explain the concept of sand drain. Discuss the free strain case without smear. (4)

6.a.Derive an expression for unconfined compressive strength q_u in terms of C' and φ'. Take B=1 and initial capillary tension =u. Hence deduce the ratio of c_u/p for NC soil, where p is pre consolidation pressure. (4)

   b. Discuss consolidated-undrained and consolidated-drained tests for NCC and OCC. (4)

7.a.Discuss Skempton's pore pressure parameters giving the equation and describe it's significance. How these parameters are determined from triaxial test. (4)

   b. What is stress path. Explain its applications. (4)