Department of Civil Engineering
CEL222 Engineering Geology and Soil Mechanics
Major Test (part 2)

Answer all questions — Time 1 hour
Assume suitable value/s of the missing data — April 29th, 2008
Max Marks: 40

Write the description of all symbols/notations and their units

Q1. An undisturbed soil sample of normally consolidated elay thiek deposit was obtained from a El. -16m. The water table was on the ground surface at El. 0m. The speeific gravity of the soil was determined as 2.64 and bulk density as 16.25kN/m^3. The unit weight of water may be assumed as 10kN/m^3. The sample was plaeed in an odeometer and stresses of 25, 50, 100, 250, 500 and 1000kN/m^2 were applied and at eaeh stage complete eonsolidation took place. At the end of this the void ratio was 0.6. Now the sample was unloaded up to a stress level of 50kN/m^2 and then reloaded in stages up to 1600kN/m^2.

a. Draw the typical e *vs* log effective stress curve/s for the test eonducted.
b. Determine Compression Index.
e. Estimate the value of past maximum effective stress this sample has experienced in the field.
d. Explain the procedure of another test you would like to eonduet to determine the permeability of this soil.

(20)

Q2. It is observed that for some soils the S_u value is greater than S_d value and for other soils S_d is greater than S_u. State the type/s of soil where these behaviours can be observed and explain the reasons for this behaviour. Is it possible to have $S_u = S_d$? If yes, for what soil type it would be valid? **(10)**

Q3. Write short notes on pore water pressure parameter B. **(5)**

Q4. Draw typical eurves of Deviator stress *vs* axial strain and volumetric strain *vs* axial strain for loose, medium dense and dense sand. Also write the test from which you will obtain this data. **(5)**