Birzeit University
Faculty of Engineering
Department of Civil and Environmental Engineering
ENCE 331, Soil Mechanics
Second semester 2020-2021
Midterm Exam

Question 1: (35 Points)

The permeameter has a square cross-section is filled with layers of soil of different permeabilities. After a while, the water reached stable levels as shown.

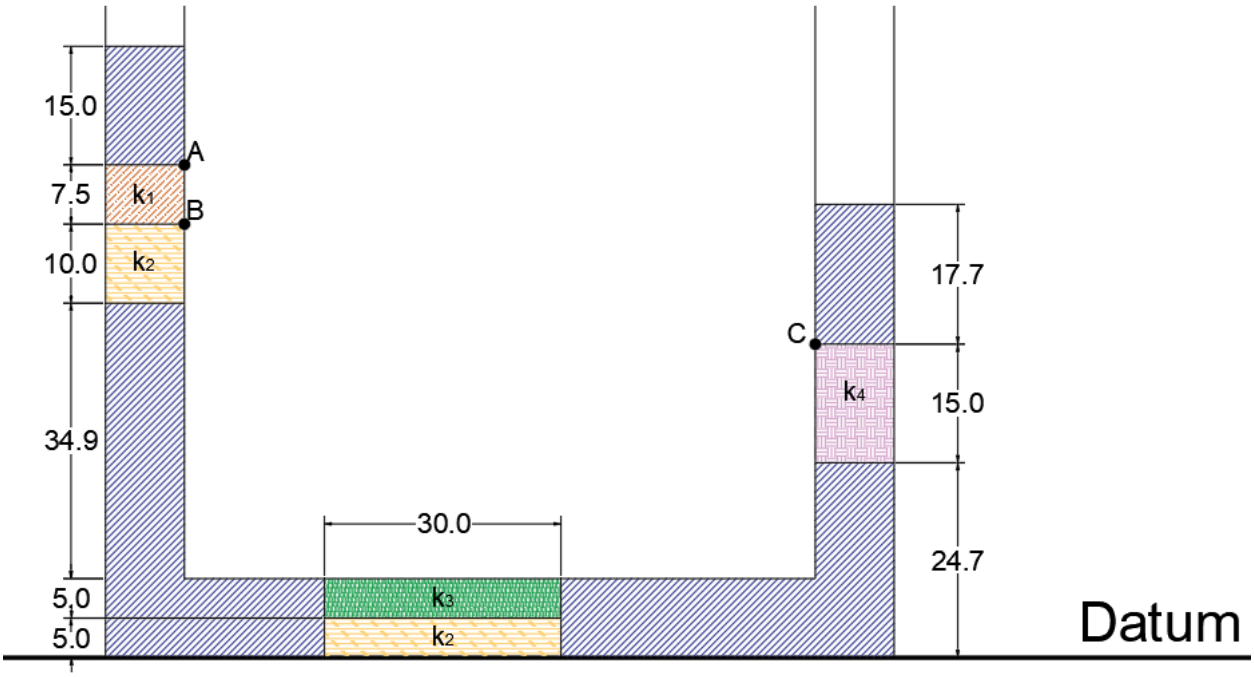
- Find the equivalent permeability for the assembly of soils.
- What is the required water supply rate to maintain a constant head?
- What is the flow rate through soil 3 only?
- Find the **Total head**, **elevation head** and **pore water pressure** at points (A, B, C) with respect to the given datum.

Fill the quantities in the following table.

	Total head (cm)	Elevation head (cm)	Pore-water pressure (kPa)
A			
B			
C			

Given: $k_1=2k_2=3k_3=k_4 = 2x10^{-3}$ cm/sec

All units are in cm



Question 2: (35 Points)

The concrete dam shown below is resting on a permeable soil layer with coefficient of permeability $k=4x10^{-3}$ cm/s. for the drawn flow net determine:

- The total discharge through the soil (m^3/day/m).
- Is the dam weight enough to resist the uplift force? Calculate F.S. against uplift.

[γ_{water} = 10 kN/m^3, $\gamma_{concrete}$=24 kN/m^3]