

QUESTION 1

(a) Write down Terzaghi's one-dimensional consolidation equation. State at least **five** assumptions in deriving this equation.

(b) Answer **ONLY** with an illustrative **PLOT**:

- Show the geometrical construction (proposed by Casagrande) for determining the preconsolidation pressure.
- Illustrate square-root time method to determine the coefficient of consolidation.
- Illustrate Schmertmann procedure to obtain the field virgin compression curve for normally consolidated soil.

QUESTION 2

A 1.2 m high highway embankment of large lateral extent is to be placed over a surface clay deposit of 10 m thickness which is underlain by a sand layer as shown in the figure below. Embankment fill has a unit weight of 16.1 kN/m^3 and the groundwater is at the original clay surface.

- Compute the ultimate settlement expected under the embankment.
- If the maximum tolerable settlement of the embankment surface pavement is 3 cm, when should the pavement be placed after completion of embankment placement?
- What is the average excess pore water pressure at the completion of embankment placement? Assume it is completed very rapidly.
- What would the average excess pore water pressure be at the time of paving.

