系所組別：土木工程學系乙組

考試科目：土壤力學 考試日期：0222，節次：2

※ 考生請注意：本試題不可使用計算機。 請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

1. Explain the following professional determinations

(1)黏土礦物共可分為哪幾種(3%)試分別畫出其構造(5%)

(2) well graded soil (4%) poorly graded soil (4%)

(3) sand boiling condition (4%)

2.Descript the graphic procedure to determine the preconsolidation pressure of clay sample from laboratory e-log σ' plot. (9%)

3. Assume slope cutting and river erosion reduce the horizontal stress but not vertical stress of the soils. Use Mohr circle and Mohr-Coulomb criteria to explain why slope cutting and river erosion cause soil failures. (8%)

4. (1) What are UU, CU, and CD triaxial tests in soil mechanics (9%).

(2) Describe the testing procedures of the UU, CU, and CD tests. (15%)

5. A three layer stratified soil with horizontal and vertical hydraulic conductivity k_H and k_v (Fig. 1). Derive the equivalent hydraulic conductivity.

(1) In horizontal direction, $k_{H(eq)}$ (5%)

(2) In vertical direction, $k_{V(eq)}$ (5%)

(3) If $k_{H1}=3\times10^{-3}$cm/sec, $k_{H2}=2\times10^{-3}$cm/sec, $k_{H3}=1\times10^{-3}$cm/sec; $k_{V1}=3\times10^{-4}$cm/sec, $k_{V2}=2\times10^{-4}$cm/sec, $k_{V3}=1\times10^{-4}$cm/sec; and $H_1=1$m, $H_2=2$m, $H_3=3$m, calculate the ratio of $k_{H(eq)}/k_{V(eq)}$ (5%)

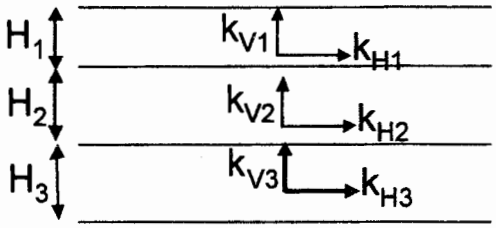

Fig. 1

6. Descript the logarithm-of-time method and square-root-of time method to determine coefficient of consolidation (16%)

7. Derive the governing equation of Laplace equation of continuity used to generate the flow net in soil mechanics (8%)