

※ 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. Plot the structures of kaolinite (3%), illite (3%) and montmorillonite (3%) with Gibbsite sheet and Silica sheet.
2. Derive the formula to calculate the moist unit weight of soil from the given water content, specific gravity of soil grain, void ratio, and unit weight of water. (6%)
3. What kinds of tests must be done to conduct unified soil classification system (10%). In addition, how to clarify the organic and non-organic fine soils in the unified soil classification system (5%).
4. Discuss the structure of clay soils (5%), hydraulic conductivity (5%), and stress-strain behavior (5%) of compacted soils in the dry side and wet side of the optimum moisture content, respectively.
5. Derive the formula of constant-head test to determine hydraulic conductivity of soil in the laboratory. (10%)
6. What is quick condition?(5%) How to calculate the critical hydraulic gradient of the quick condition?(5%)
7. Derive the formulas to get two dimensional major and minor principle stresses, respectively, with a soil element subjecting to horizontal stress, σ_x , vertical stress, σ_y , and shear stress, τ_{xy} . (16%)
8. How to determine the coefficient of consolidation of soils using logarithm of time method (7%) and square root of time method (7%)
9. Plot a stress path, q' against p' , for a consolidated-undrained triaxial test on a normally consolidated clay (5%)