

※ 考生請注意：本試題不可使用計算機

一. 名辭解釋

1. 壓密 (consolidation) (3%)、夯實 (compaction) (3%)
2. Mohr failure criteria (4%)、Coulomb failure criteria (4%)、Mohr-Coulomb failure criteria (3%)
3. Normally consolidated clay (3%)、Overconsolidated clay (3%)、OCR (3%)
4. 靈敏度(sensitivity) (3%)、thixotropy of soils (3%)
5. What is discharge velocity (3%) and what is seepage velocity (3%) in seepage.

二. Derive the formula of falling-head test (10%) and the one for the pumping test from a well in an unconfined permeable layer underlain by an impermeable stratum (10%) to determine hydraulic conductivity of soils.

三. Derive the formula of one-dimensional consolidation for saturated clay proposed by Terzaghi (10%) and what are the assumptions of the mathematical derivations (6%)

四. What tests must be conducted to carry out the Unified Classification System in soil mechanics? (6%) and write down the meaning of the following symbols in the system Pt, GP, GM, CH and OL (5%)

五. What tests can we used in the laboratory to obtain the hydraulic conductivity of the soils (6%)

六. Describe the characteristics of UU, CU, and CD test in tri-axial compressive tests (9%)