

國立成功大學

112學年度碩士班招生考試試題

編 號：164

系 所：自然災害減災及管理國際碩士學位
學程

科 目：土壤力學

日 期：0206

節 次：第 3 節

備 註：不可使用計算機

※ 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. (a) Please plot the soil element with the volume and weight of solid, air and water (5%)
 (b) Please explain the meaning of water content w . (5%)
 (c) Please explain the meaning of void ratio e . (5%)
 (d) Please explain the meaning of dry unit weight γ_d . (5%)
2. Please derive the following equations,
 (a) $Se = wG_s$ (5%)
 (b) $\gamma_d = \frac{\gamma_s}{1+e}$ (5%)
 (c) $\gamma_{sat} = \frac{G_s + e}{1+e} \gamma_w$ (5%)
3. (a) What is Darcy's law, please explain. (10%)
 (b) What kind of tests are suitable for determine the permeability of sand and clay? (5%)
4. (a) An earth dam is planned to place in a river channel and the soil used for the material of dam core needed to be determined. What kind of soil is suitable for the dam core of earth dam (sand, gravel, clay, silt, peat.....)? (5%)
 (b) The proctor test results of the material of dam core are presented in the Figure 1. Please determine the most suitable water content of the dam core (w_1 , w_2 or w_3) and explain the reason. (10%)
5. (a) What is the pressure bulb? (5%)
 (b) When a breakwater with a width 20m, please determine the depth for the soil investigation before the engineering design? (5%)
6. Please explain the following proper noun,
 (a) Over-consolidation ratio (5%)
 (b) Compression index C_c (5%)
 (c) Secondary consolidation (5%)
7. A soil element A is 10m under the soil surface in Figure 2 and with the coefficient of earth pressure at rest $K_0=0.4$. Please plot the effective stress of point A with the Mohr's Circle (10%)

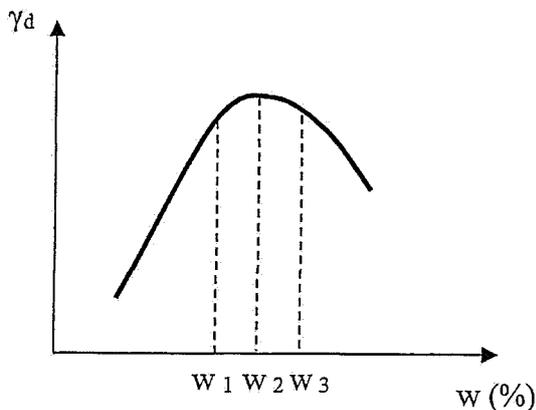


Figure 1

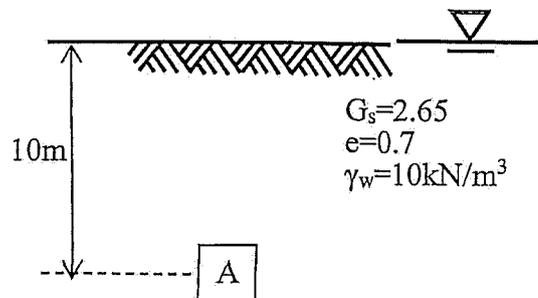


Figure 2