

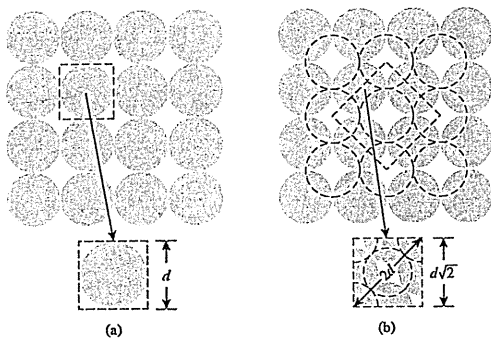
※ 考生請注意：本試題可使用計算機。請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

一、簡答題: (80 分)

1. What is stress path? [5 分]; What does the K_f line represent? [5 分]; How to find the cohesion and friction angle from the K_f line [10 分]

2. For a given soil of properties: Specific gravity of soil solids = 2.74, moist unit weight = 20.6 kN/m^3 , and moisture content = 16.6%. Determine: Dry unit weight [5 分]; Void ratio [5 分]; Porosity [5 分]; Degree of saturation [5 分]

3. Estimate the void ratios of the following packing states (a) [10 分]; (b) [5 分]:



4. Describe the features of a UU triaxial compression test, including: how it is performed, draw the total stress Mohr's circles and failure envelope obtained from such test on fully saturated cohesive soil, and write the equation of the undrained shear strength [15 分]

5. Write the full equation of the 1-D consolidation: including the primary settlement (S_c), compression index, swelling index, clay thickness (H), and the e - $\log(\sigma)$ relationship [10 分]

二、分析題: (20 分)

1. 完整詮釋與翻譯以下: [20 分]

The *shear strength* of a soil mass is the internal resistance per unit area that the soil mass can offer to resist failure and sliding along any plane inside it. One must understand the nature of shearing resistance in order to analyze soil stability problems, such as *bearing capacity*, *slope stability*, and *lateral pressure on earth-retaining structures*. In addition, a selected number of concepts, including but not limited to index properties, soil classification, compaction, and consolidation are also important.