編號： 103

國立成功大學 107 學年度碩士班招生考試試題

系　　所：土木工程學系

考試科目：土壤力學

考試日期：0205，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。

一、簡答題: (80 分)

1. In terms of mechanical behavior, define "Homogeneous Soil" and "Isotropic Soil" (10%)
2. In classification naming convention, what are the followings:
   First Letters: M, C, O, S, G (5%); Second Letters: L, H, P, W, M (5%)
3. The degree of compaction of a soil is measured in terms of its "what"? (5%)
4. Define and explain: "Over-compaction" (5%)
5. Define and explain: "Pre-consolidation Pressure", "Over-consolidation", and "OCR" (15%)
6. Describe the feature of a CU triaxial compression test and how it is performed (15%)
7. Lambe (1964) suggested a type of stress path relationship that plots q' against p'. Define q' and p' (5%); Explain the meaning of "Stress Path"? (5%)
8. Derive the equation of the zero-air-void unit weight (10%) [given: $\gamma_d = \frac{G_s \gamma_w}{1+e}$]

二、分析題: (20 分)

完整詮釋與翻譯以下: (20 分)

While the finite element method has been used in many fields of engineering practice for years, it is only relatively recently that it has begun to be widely used for analyzing geotechnical problems. To perform useful geotechnical finite element analysis, an engineer requires specialist knowledge in a range of subjects and experimental background. Firstly, a sound understanding of soil mechanics and finite element theory is required. Secondly, an in-depth understanding and appreciation of the limitations of the various constitutive models that are currently available is needed. Lastly, users must be fully conversant with the manner in which the software they are using works. Unfortunately, it is not easy for a geotechnical engineer to gain all these skills. It is perhaps, therefore, not surprising that many engineers, who carry out such analyses and/or use the results from such analyses, are not aware of the potential restrictions and pitfalls involved.

[Given: Finite element method = 有限元素法; constitutive models = 組成律模型]