編號： 117

國立成功大學 104 學年度碩士班招生考試試題

系所組別：工程科學系丙組

考試科目：近代物理

考試日期：0212，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。

1. Find an expression for the relativistic velocity of a particle of charge q moving in a circle of radius R at right angles to a magnetic field B by using Newton's second law. (25%)

2. A crystalline material has a set of Bragg planes separated by 1 Å. What is the highest-order Bragg reflection for 2eV neutrons? (25%)

3. It is desired to measure the momentum and position of an electron by observing it with a microscope. Analyze the process of observation in detail to show that results consistent with the uncertainty principle are obtained. (30%)

4. Calculate the frequency at which an electron's orbital magnetic moment $\boldsymbol{\mu}$ precesses in a magnetic field $\boldsymbol{B}$. (20%)