國立成功大學

114學年度碩士班招生考試試題

編　號：88

系　所：工程科學系

科　目：近代物理

日　期：0211

節　次：第 2 節

注　意：1.不可使用計算機
2.請於答案卷(卡)作答，於試題上作答，不予計分。

1、A moving particle behaves in specific ways as though it has a wave nature. Define the group velocity and the phase velocity of the de Broglie waves. (25%)

2、Given a particle that is in a box with a width L, show that the general formula for the permitted de Broglie wavelengths of the trapped particle is $\lambda_n = 2L/n$, $n = 1,2,3,\ldots$. (25%)

3、Determine the *maximum wavelength* of the photon that will separate a molecule whose binding energy is 10 eV. (25%)

4、Assume that $E = mv^2/2$ for a particle moving in a straight line. Show that $\Delta E \Delta t \geq h/4\pi$, where $\Delta t = \Delta x/v$. (25%)