編號： 119

國立成功大學 105 學年度碩士班招生考試試題

系　　所：工程科學系

考試科目：近代物理

考試日期：0228，節次：2

第1頁，共1頁

※ 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. Determine the *maximum wavelength* of the photon that will separate a molecule whose binding energy is 10 eV. (20%)

2. Show that the photoelectric effect *cannot* occur for free electrons. (20%)

3. Suppose the mean lifetime of the excited state of an atom is 10^{-8} s. What is the *natural width* of the state? (25%)

4. As described by the first law of thermodynamics, $dE_T = dQ - pdV$, for a reversible process, the pressure p may be written as $p = -(\partial E_T/\partial V)_Q$. Find an expression for the pressure of a quantum-mechanical gas in terms of E_T. (35%)