

臺北市立大學

104 學年度第一學期學士班二、三年級轉學生招生考試試題

系 別：應用物理暨化學系（三年級）

科 目：普通物理學

考試時間：90 分鐘【8:30-10:00】

總 分：100 分

不得使用計算機
或任何儀具。

※ 注意：不必抄題，作答時請將試題題號及答案依照順序寫在答案卷上；限用藍色或黑色筆作答，使用其他顏色或鉛筆作答者，所考科目以零分計算。（於本試題紙上作答者，不予計分。）

問答題（共 100 分）

1. Calculate the electric field right at distance d above a metallic disk of radius R carrying a uniform charge density σ . (20%)
2. Consider the Helmholtz coils of radius R and separate at a distance d . (30%)
 - (a) Show the magnetic field is roughly uniform nearby the midpoint of coils with equal currents flowing in the same sense.
 - (b) Show the magnetic field is zero at the midpoint of coils with equal currents flowing in the opposite sense.
3. Consider a cube of length d placed with one of its corner coinciding with the origin. (30%)
 - (a) Calculate the moment of inertia if the cube rotates with z -axis.
 - (b) Find a rotating axis such that the array of the moment of inertia is diagonal.
4. Consider a 6-particle system with energies $E_0, 1.6E_0, 2E_0, 2.5E_0, 4E_0, 5.5E_0$, respectively. The classical behaviors obey Maxwell-Boltzmann distribution. Calculate the average energy of the system. (20%)

