中國文化大學98學年度轉學招生考試

系組：物理學系三年級　　日期節次：7月28日第3節 13:30-14:50

科目：**電磁學**　(15-25)

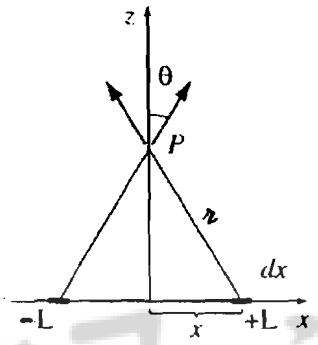
考生作答前請詳細閱讀下列注意事項以免評分錯誤：

1)請在答案紙欄上依序註明題目號碼(例如:1、2、....、4)

2)計算題詳細明列計算過程和最終結果

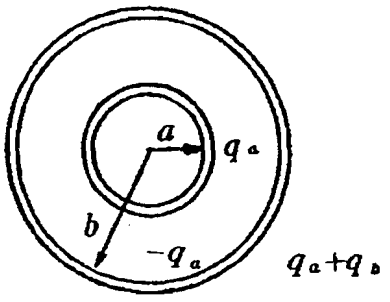
3)計算題附帶之圖形及任何符號請勿作任何更改

1. If $\vec{A}=(2x^2y-x^4)\hat{i}+(e^{xy}-y\sin x)\hat{j}+(x^2\cos y)\hat{k}$, find $\frac{\partial^2\vec{A}}{\partial x^2}$, $\frac{\partial^2\vec{A}}{\partial x\partial y}$, and $\frac{\partial^2\vec{A}}{\partial y^2}$。(25%)



Problem-2

2. Find the electric field a distance z above the midpoint of a straight line segment of length $2L$, which carries a uniform line charge density λ。(25%)



Problem-3

3. Find the capacitance C of two concentric spherical metal shells, with radii a and b。(20%)

4. Show that the Maxwell's equations in free space (vacuum) may predict the existence of the electromagnetic wave motions。(30%)