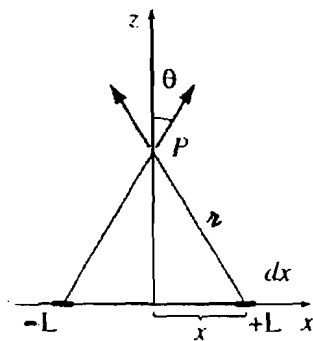


考生作答前請詳細閱讀下列注意事項以免評分錯誤：

- 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

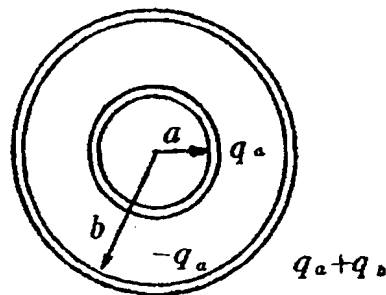
1. If $\vec{A} = (2x^2y - x^4)\hat{i} + (e^{xy} - y\sin x)\hat{j} + (x^2\cos y)\hat{k}$, find $\frac{\partial \vec{A}}{\partial x^2}$,

$\frac{\partial \vec{A}}{\partial xy}$, and $\frac{\partial \vec{A}}{\partial y^2}$. (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%)