淡江大學九十四學年度碩士班招生考試試題 84-1

系別：電機工程學系　　科目：電　磁　學(含電磁波)

准帶項目請打「V」	
X	簡單型計算機

本試題共 1 頁

一. Point charges 1 mC and -2 mC are located at (3, 2, -1) and (-1, -1, 4) respedirely. Calculate the electric field density at that point. (20%)

二. Conducting spherical shell with radii a = 10cm and b = 30cm are maintained at a potential difference of 100V such that V(r=b) = 0 and V(r=a) = 100 voltage. Determine the V and E in the regim between the shells. (20%)

三. Given the magnetic vector potential $A = -\frac{\rho^2}{4}\hat{a}_z$ wb/m, Calculate the magnetic flux crossing the surface $\varphi = \frac{\pi}{2}$, $1 \le \rho \le 2$m $0 \le z \le 5$m. (20%)

四. In free space ($z \le 0$), a plane wave with $H = 10\cos(10^8 t - \frac{1}{3}z)\hat{a}_x$ mA/m is incident normally on a lossless medium ($\epsilon = 2\epsilon_0$, $\mu = 8\mu_0$) in regim $z \ge 0$. Determine the total field H^t in each regim. (20%)

五. Write down the Maxwell's equations for time-harmonic fields and solve the electric field by magnetic vector potential. (20%)