淡江大學八十九學年度碩士班招生考試試題

系別：電機工程學系　　科目：電　磁　學(含電磁波)

本試題共 1 頁

一、Write down the Gauss's law for electrostatic field and Ampere's law for magnetostatic field in integral form. Explain the meaning of the equations. (20%)

二、A point charge Q is located at point (a, 0, b) between two semi-infinite conducting planes intersecting at right angles as Fig. 1. Determine the potential at point P(x, y, z). (20%)

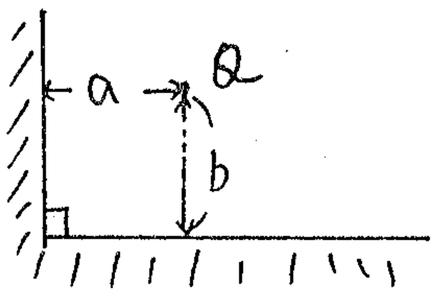

Fig. 1

三、If plane Z=0 carries uniform current $\vec{K} = K_y \vec{a}_y$, find the magnetic field $\vec{H}$ by using the concept of vector magnetic potential. (20%)

四、A lossy dieledric has an intrinsic impedance of $200\angle 30^\circ\ \Omega$ at a particular frequency. If, at that frequency, the plane wave propagation through the dieledric has the magnetic field $\vec{H} = 10\, e^{-\alpha x} \cos(\omega t - \frac{1}{2}x)\, \vec{a}_y$ find $\vec{E}$ (electric field) and α? (20%)

五、Write down the Maxwell's equations and continuity equation. Show that their dependent relation. (20%)