

元智大學 102 學年度研究所 碩士班 招生試題卷

系(所)別：光電工程學系碩士班

組別：不分組

科目：電磁學

用紙第 () 頁共 () 頁

●不可使用電子計算機

1. Write down Maxwell's equations:

- (a) instantaneous differential form,
- (b) instantaneous integral form,
- (c) time-harmonic differential form,
- (d) time-harmonic integral form,
- (e) and describe what kind of law is utilized, respectively.

(20分, 每小題4分)

2. 求同心球間的 R & C 。其中 a & b 為內外徑。

(20分)

3. (a) Describe skin depth.

- (b) Define good dielectric mathematically.
- (c) Explain the perpendicularly polarized wave
- (d) Explain the Brewster angle and the corresponding condition.

(20分, 每小題5分)

4. Consider a point charge Q placed at a distance h from a perfect conducting plane of infinite extent, find V and \vec{E} 。

(20分)

5. A charge distribution with spherical symmetry has density

$$\rho_v = \begin{cases} \frac{\rho_0 r}{b} & 0 \leq r \leq b \\ 0 & r > b \end{cases}$$

Determine \vec{E} everywhere.

(20分)

(不列出適當過程而作答者，將予扣分。若題意不清，可自行假設條件。若懷疑題目有錯誤，可修正之，但須寫出。監試人員可不作任何題意說明)