

大葉大學 95 學年度 研究所碩士班 招生考試試題紙

系 所 別	組 別	考 試 科 目 (中 文 名 稱)	考 試 日 期	節 次	備 註
電信系碩士班	甲	電磁學	4月23日	第3節	共2頁

註：考生可否攜帶計算機或其他資料作答，請在備註欄註明（如未註明，一律不准攜帶） 13:30 ~ 15:00

1 (20%) A thin spherical metal shell of radius b has charge Q . Find the potential V at a distance d from the shell center, and the capacitance C of this shell.

2 (20%) Find the magnetic flux density \vec{B} at the center of a circular loop of radius b carrying a current I .

3 (20%) Given a plane-wave solution $\vec{E}(y, t) = \hat{a}_z \exp[j(2000\pi t + 0.00002\pi y)]$, find the frequency f , the wavelength λ , and the velocity vector \vec{v} of this plane wave.

4 (20%) Give the equivalent circuit of a transmission line, and derive the transmission line equations.

5 (20%) Consider an electric dipole antenna with an electrically very small length Δl parallel to the z -direction in free space. Assume that the current is uniformly distributed in this antenna as $I \cos \omega t$. Find the radiation fields in the far zone.