

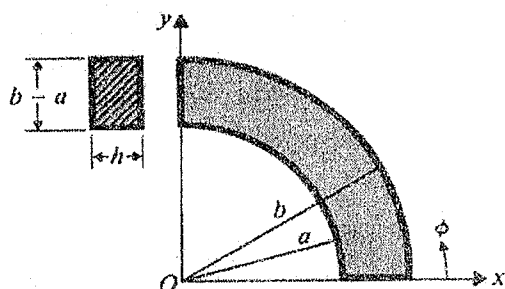
大葉大學 九十四 學年度 研究所碩士班 招生考試試題紙

系 所 別	組 別	考 試 科 目 (中 文 名 稱)	考 試 日 期	節 次	備 註
電信工程碩士班	甲	電 磁 學	3月27日	第 3 節 12:30~15:00	P2-1

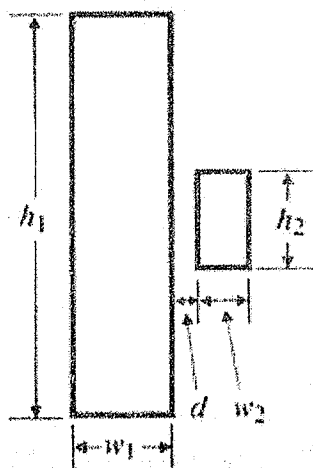
註：考生可否攜帶計算機或其他資料作答，請在備註欄註明（如未註明，一律不准攜帶）

(需詳細列出推導及演算過程，否則扣分)

- 1.) Please write down the Maxwell's equations set and continuity equation in integral form first and also identify each equation with the proper experimental or physical law, and then use Stoke's and Divergence theorems to derive their differential forms. (20 分)
- 2.) A parallel-plate capacitor of cross sectional area A and thickness d (distance between two conducting plates) is filled with a dielectric material whose relative permittivity varies linearly from $\epsilon_r = 1$ at one plate to $\epsilon_r = 10$ at the other plate. Find the capacitance. (20 分)
- 3.) A conducting material of uniform thickness h and conductivity σ has the shape of a quarter of a flat circular washer, with inner radius a and outer radius b as shown. Determine the resistance between the end faces (x and y). (20 分)



- 4.) Find the mutual inductance between two coplanar rectangular loops with parallel sides as shown. Assume that $h_1 \gg h_2$ ($h_2 > w_2 > d$). (20 分)



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5.) Given the characteristic propagation constant γ and impedance Z_0 of the line with length l as shown below, the transmission line is connected at both ends with load and generator. (20 分)

- (a) Please derive the input impedance Z_i which the generator looks into the line.
- (b) If the transmission-line segment is considered lossless ($\gamma = j\beta$) and terminated with short-circuit ($Z_L = 0$), derive the input impedance.

