共五題，每題 20 分．

參考用

20% 1. 已知電磁波中，電波的形式是：

$$E_x = E_o \, e^{i(ky-\omega t)} \quad , \quad E_z = 0$$
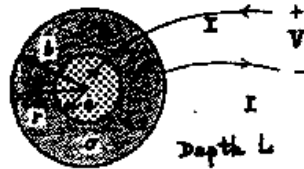
試求 E_y (5%) 及磁波的函數 (15%)．

20% 2. 試以任意一法設計

　　1. 直流電流探測器；(5%)

　　2. 波寬可靠至 10^{-4} 秒以上之交流電流
　　　探測器．(15%)

20% 3. 試解說同步輻射加速器的工作原理 (10%)，
　　以及何以能放出某特定波長的電磁波 (10%)．

20% 4. Two perfectly conducting coaxial cylinders of length L, inner radius a, and outer radius b are maintained at a potential difference V and enclosed a material with ohmic conductivity σ, as shown in the figure. Find the resistance of the coaxial cylinder configuration.

20% 5. The potential in the x-z plane is given by $V = V_o \sin(px)$ and is independent of z as shown in the figure. Find the potential at all points.