※ 考生請注意：本試題不可使用計算機。　請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

1. For a coaxial capacitor of length L, find the force between the inner conductor of radius b and the outer conductor of radius a that carry charges $+Q$ and $-Q$, respectively. The permittivity of the insulating material is ε. (20%)

2. A d-c voltage V_0 is applied across a cylindrical capacitor of length L. The radii of the inner and outer conductors are b and a, respectively. The space between the conductors is filled with two different lossy dielectrics having, respectively, permittivity ε_1 and conductivity σ_1 in the region $b < r < c$, and permittivity ε_2 and conductivity σ_2 in the region $c < r < a$. (30%)
(1) Determine the equivalent R-C circuit between the inner and outer conductors. (15%)
(2) Determine the current density in each region. (15%)

3. Calculate the force per unit length on each of three equidistant, infinitely long, parallel wires 10(cm) apart, each carrying a current 10(A) in the same direction. (25%)

4. A dielectric fiber of a transparent material can be used to guide an electromagnetic wave. Determine the minimum dielectric constant of the guiding medium such that a wave incident on one end at *any angle* will be confined within the fiber until it leaves from the other end. (25%)