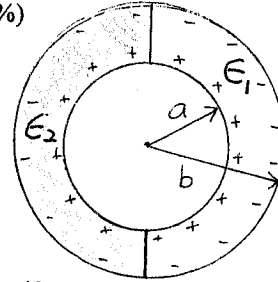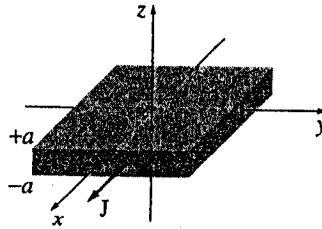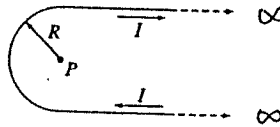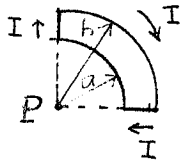系所別：　　大氣物理研究所　　科目：　　　電磁學　　
　　　　　　水文科學研究所

1. The region between two concentric spherical shells is filled with two different dielectrics, as shown in figure. Find the capacitance of the system. (20%)

2. A thick slab extending from $z = -a$ to $z = +a$ carries a uniform volume current $\bar{J} = J\hat{x}$. Find the magnetic field, as a function of z, both inside and outside the slab. (20%)

3. Find the magnetic field at point P for each of the steady current configurations shown in the figure. (20%)

4. State the Maxwell's equations and boundary conditions. (20%)

5. What are : (20%)
    (1) Plane wave
    (2) Poynting vector
    (3) Magnetic dipole moment
    (4) Biot-Savart law