1. A parallel plate capacitor with circular radius 25 cm separated by a distance of 0.15 cm is connected to a source of alternating emf. The voltage across the plates oscillates with an amplitude of 5000 V and a frequency of 60 Hz. What is the amplitude of the magnetic field between the plates at a distance of 20 cm from the axis of the capacitor?

2. Consider a closed cylindrical metallic can. You want to establish oscillating electromagnetic fields in this can. If the oscillations are to have a frequency of 2.0 10^9 Hz, what must be the radius of the can?

3. In the electron gun of a TV tube, an electron is accelerated by a constant electric field and acquires a kinetic energy of 3.2×10^{-15} J within a distance of 2.0 cm. What is the magnitude of the electric radiation field that this accelerated electron generates at a distance of 5.0 cm at right angles to its direction of motion?

4. The electric field in a copper wire of diameter 0.26 cm carrying a current of 12.0 A is 3.9×10^{-2} V/m

   (a) What is the acceleration of one of the free electrons of copper in this electric field?

   (b) What are the transverse electric and magnetic fields that the accelerated electron produces at a distance of 4.0 m perpendicularly away from the wire?

5. What is the self inductance of a single loop of radius R?

6. An alternating current $I = I_0 \cos \omega t$ flows down a straight wire and turns returns along a coaxial conducting tube of radius a

   (a) What is the magnetic field inside the tube?

   (b) What is the induced electric field inside the tube?

   (c) Find the displacement current density, I_d.

   (d) Integrate the displacement current and compare it with I.