1. An electron is moving at 45,000 m/s towards the south-east. The earth's magnetic field points due north with a strength of $0.5 \times 10^{-4}$T. What force does the earth's magnetic field exert on the moving electron?

2. An expandable circular wire ring is placed flat on a table on which a magnetic field with strength 0.65 T points downwards. The ring is expanded slowly so that its radius can be expressed as a function of time as: r = (0.4mm/s)t. If the ring has a total resistance of 35 Ω, what is the strength and direction of the current induced due to the expansion at the time of 4 seconds

3. A wire of length 45 cm is bent into an equilateral triangle and placed flat on a table. A current of 25 mA passes through the wire in a clockwise direction (looking from the top). Find the magnitude and direction of the magnetic field at the center of the triangle.

4. A solenoid has a cross sectional area of $5.5 \times 10^{-4}\ m^2$ it has 340 turns and is 12 cm long. The solenoid is placed in series with a capacitor to form a circuit which resonates at a rate of 450,000 cycles per second. What is the capacitance of the capacitor?

5. An electromagnetic plane wave a certain location has an electric field pointed up which is given as a function of time as E=54 V/m x sin ($6x10^6$Hz x t). The magnetic field at the same location points south when the electric field points up. What is the pointing vector at this location for this wave as a function of time?

6. A plane electromagnetic wave is travelling southward. At a specific time and place, the electric field from the wave points upwards with a magnitude of 63V/m. What is the magnitude of the magnetic field at the same point in time?

7. A series *RLC* circuit has *R* = 425Ω, and *C*= 3.50 µF. It is connected to an AC source with *f*=60.0 Hz and $\Delta V_{max}$=150 V. What should be the inductance such that the current leads the applied voltage by $30.0^o$? All other values remain constant.