Practice Problems A - Induced EMF & Current

1. A single circular loop with a radius of 22 cm is placed in a uniform external magnetic field with strength of 0.5 T so that the plane of the coil is perpendicular to the field. The coil is pulled steadily out of the field in 0.25 s. Find the average induced emf during this interval.

2. A coil with 205 turn of wire, a total resistance of 23 ohms and a cross sectional area of .025 m2 is positioned with its plane perpendicular to the field of powerful electromagnet. What average current is induced in the coil during the 0.25 s that the magnetic field drops from 1.6 T to 0.0 T?

3. A circular wire loop with a radius of 0.33 m is located in external magnetic field of strength of +0.35 T that is perpendicular to the plane the loop. The field strength changes to -0.25 T in 1.5 s. (the plus and minus signs for a magnetic field refer to opposite direction through coil). Find the magnitude of the average induced emf during this interval.

4. A 505 turn circular loop coil with a diameter of 15.5 cm is initially aligned so that its plane is parallel to the Earth’s magnetic field. If an average emf 0.1666 V is induced in the coil, what is the value of the Earth’s magnetic field?