PHY 122 Report on Experiment 6: Induction

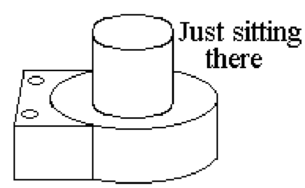
Name ______________________________________

Part 1.
Coil's outside diameter: __________ Inside diameter: __________ average: __________

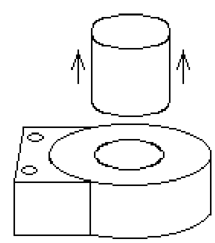
Coil's length: L = __________ N = 570 turns r_{av} = __________

$t_i = 0$ $I_i = 0$ t_f = __________ I_f = __________

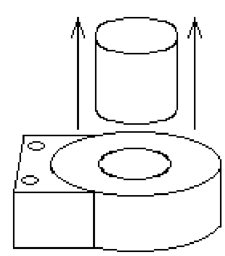
Measured V = __________
Calculations:



Part 2: A) A coil is connected to a galvanometer. A magnet is placed against the coil, stationary. Once the effects of putting it there pass, how far is the needle from zero?



Starting against the coil, then moving the magnet away very slowly, along the coil's axis, how far does the needle go from zero?



Starting against the coil, then moving the magnet away very quickly, along the coil's axis, how far does the needle go from zero?

(In each blank put "FLUX", "FIELD STRENGTH", or "RATE THE FLUX CHANGES":) This last result shows that the induced emf depends on the

____________________________, not ____________________________or

____________________________ because ____________________________ and

____________________________depend only on how far away the magnet is, but

____________________________depends on how fast it's moving.

Part 3. A transformer made from two identical coils linked by an iron bar is connected to a DC power supply. A galvanometer is connected to the secondary coil to detect any induced current. With steady DC in the primary, the galvanometer shows

The power supply is turned off and on, like the primary current in a car's ignition coil. I observe

The transformer is now connected to an AC power supply and AC meters. This time, I observe

Part 4. A coil between the poles of a permanent magnet is spun. A galvanometer connected to this coil __________ (does/ does not) show an induced current. Faraday's law says there must be a changing flux for induction to happen, but B from this permanent magnet does not change. The explanation for what I saw is

The same device is now connected to a power supply and used as a simple DC motor. While running,
V = ________________ and I = ________________.
The power taken in by the motor is

The energy it uses in one minute is