Name: Class:

Experiment 5: Magnetism

Read over the lab manual and then answer the following question.

a) State the objective of the experiment.

.....

b) Identify the variables of the experiment.

Manipulated variable : .....

Responding variable : .....

Constant variable : .....

c) Theory:

i) What is the quantities represented by the symbol $\vec{B}, \overrightarrow{B_S}$ *and* $\overrightarrow{B_E}$

$\vec{B}$: .....

$\overrightarrow{B_S}$: .....

$\overrightarrow{B_E}$: .....

ii) The magnetic field strength at the end of solenoid is given by

$$B_E = \frac{\frac{1}{2}\mu_0 N}{Lm}$$

$$B_s = \frac{1}{2}\left(\frac{\mu_0 NI}{L}\right)$$

d) Procedures:

i) What is the first thing you need to record?

.....

ii) At what direction the compass needle should be adjusted in the beginning of the experiment?

.....

iii) How to do you adjust the value of current, *I*?

.....

e) Data tabulation and analysis.

i) What graph do you need to plot for this experiment?

.....

ii) What is equation used to plot the graph?

$$B_E = \frac{\frac{1}{2}\mu_0 N}{Lm}$$

$$B_s = \frac{1}{2}\left(\frac{\mu_0 NI}{L}\right)$$

$$\tan\theta = \frac{\frac{1}{2}\mu_0\left(\frac{N}{L}\right)I}{B_E}$$

iii) Compare the equation used to plot the graph from e) (ii) with straight line equation, $y = mx + C$

y
m
x
C

$$\tan\theta = \frac{\frac{1}{2}\mu_0\left(\frac{N}{L}\right)I}{B_E}$$

iv) How do you determine the value of horizontal component of the earth's magnetic field, B_E?

$$B_E = \frac{\frac{1}{2}\mu_0 N}{Lm}$$

$$B_s = \frac{1}{2}\left(\frac{\mu_0 NI}{L}\right)$$