■ KEY ■

First Name:_____   Last Name:_____

L16 – FQ – Motor Effect and Circular Motion

Use the following information to answer Q1-Q2:

An electron, moving at 6.0×10^4 m/s, enters a magnetic field of 2.3×10^{-2} T, as per the diagram below.

Q1: The electron experiences a force to the ___*i*___ and therefore rotates ___*ii*___.

	i.	ii.
A.	left	clockwise
B.	left	counter-clockwise
(C.)	right	clockwise
D.	right	counter-clockwise

Q2: The radius of curvature of the electron is $a.bc \times 10^{-d}$ m, where *a, b, c,* and *d* are ___, ___, ___, and ___.

*(Record your **three digit** answer in the Numerical Response boxes below)*

1	4	9	5

$$F_c = F_m$$

$$\frac{mv^{\cancel{2}}}{r} = qvB$$

$$\frac{mv}{r} = qB$$

$$r = \frac{mv}{qB} = \frac{(9.11 \times 10^{-31})(6.0 \times 10^4)}{(1.60 \times 10^{-19})(2.3 \times 10^{-2})}$$

$$r = 1.485326086966 \times 10^{-5} \, m$$

$$r \approx 1.49 \times 10^{-5} \, m$$

Use the following information to answer Q3:

A moving proton is subject to three different types of fields, per the diagram below.

Directions

Q3: The directions of forces can be described using the numbers given above.

Direction:	6	6	9
Force:	Gravitational force acting on the proton in Diagram #1	Electrostatic force acting on the proton in Diagram #2	Magnetic force acting on the proton in Diagram #3

*(Record your **three digit** answer in the Numerical Response boxes below)*

6	6	9	

MARKING:

Beginning	0.0 – 1.0
Progressing	1.5 – 2.0
Competent	2.5
Exemplary	3.0