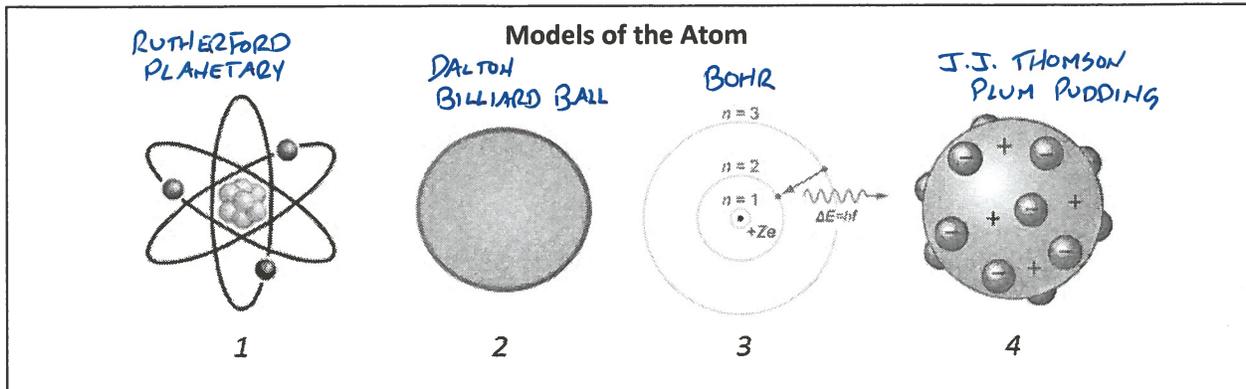First Name:_____   Last Name:_____

LO2 – Formative Quiz – The Electron

Use the following information to answer Q1-2:

Models of the Atom

RUTHERFORD PLANETARY

DALTON BILLIARD BALL

BOHR

$n = 3$

$n = 2$

$n = 1$

$+Ze$

$\Delta E = hf$

J.J. THOMSON PLUM PUDDING

1   2   3   4

Q1: The different models of the atom, when ordered from *oldest* to *newest*, are ___, ___, ___, and ___.

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

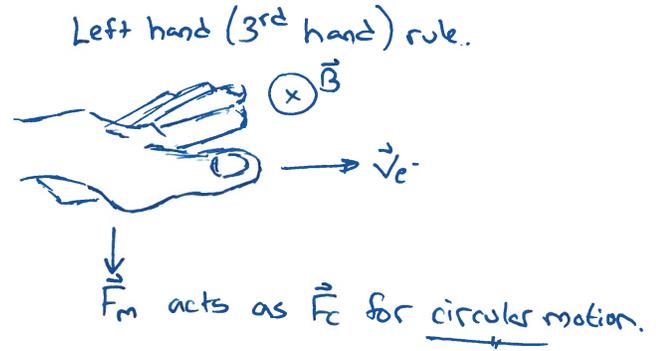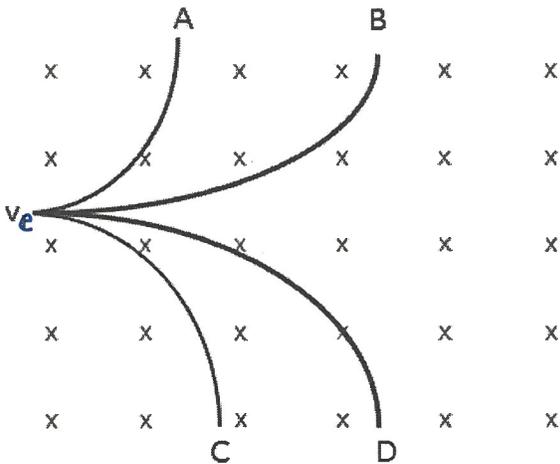| 2	4	1	3

Q2: Which model best describes the model proposed by J.J. Thomson after his experiments involving Cathode Rays?

    a.   Model *1*
    b.   Model *2*
    c.   Model *3*
    (d.) Model *4* → First model with electrons.

Q3: A Cathode Ray is best described as a beam of

    (a.) electrons
    b.   protons
    c.   EMR
    d.   X-rays

Q4: In a detection chamber of a mass spectrometer, which path is an electron most likely to take?

a. Circular path **A**
b. Parabolic path **B**
c. Circular path **C**
d. Parabolic path **D**

Left hand (3rd hand) rule.

F_m acts as F_c for circular motion.

Q5: In the velocity selector of a mass spectrometer, a particle of unknown mass and charge is subject to a magnetic field of strength 0.55 T and an electric field of strength 40 kN/C. If the particle's path is undeflected, then the particles speed is **a.bc** x 10^d m/s, where **a, b, c,** and **d** are ___, ___, ___, and ___.

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

7	2	7	4

$$\vec{F}_m = \vec{F}_e$$
$$q v |\vec{B}| = q|\vec{E}|$$
$$v = \frac{|\vec{E}|}{|\vec{B}|} = \frac{40 \times 10^3}{0.55} = 7.27 \times 10^4 \text{ m/s}$$

MARKING

Beginning	0.0 – 2.0
Progressing	2.5 – 3.5
Competent	4.0 – 4.5
Exemplary	5.0