Lab, Atomic Physics

Name _____ Period _____

PURPOSE: To review the determination of atomic particles and interactions.

PROCEDURE: Hint: Check your *Atomic Theory Notes*, and remember the *demos & video clips!*

1. Sketch a glass tube representing 40 cm in lenght. Place an anode at one end and a cathode at the other end. Diagram and explain what happens when a high voltage source (sparky) is applied when a) there is air in the tube, b) as air is slowly removed, and c) when a high vacuum is achieved.

2. Sketch the above (highly evacuated) tube with a positive charge placed on the top and a negative charge on the bottom. Show what happens to the beam (the cathode rays).

3. Sketch the above (highly evacuated) tube with a magnet placed with its poles in front and in back of the tube. Show what happens to the beam.

4. Sketch the ***Canal Ray Tube.*** What **two** biggies were discovered: a) ?, b) ?

5. Sketch the ***Tube of Sir William Crookes.*** a) What **five properties** of the rays were discovered here? b) What fundamental particle was discoverd here?

6. Sketch the ***Tube of Sir JJ Thompson***, now called the ***Mass Spectrometer***. Diagram what happens when Hydrogen Ions, $\mathbf{H^{+1}}$, are fired up the tube and deflected around the **big magnet** to the fluorescent screen. The beam splits into three beams causing three spots. a) Who are these guys? b) Why are they separated? c) What was fundamental particle was postulated here?

7. Sketch the ***Tube of Jean Perrin*** (paddle wheel). What was discovered here?

8. In the ***Tube of Sir JJ Thompson*** above, what did Sir JJ measure about the electron that was determined by the trajectory of the electron beam?

9. Sketch the ***Millikan Oil Drop Apparatus***. a) What **three** properties about the electron did Millikan discover? b) Using these properties, what did Millikan calculate for the electron?

10. Diagram and explain how ***the three rays of radioactivity*** were discovered by Lord Rutherford.

CRITIQUE: