**Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ PHY2049C, Quiz 7**

**A- Read all the quiz once, or twice, before beginning to write. Make sure to comprehend all questions and start with those you fell most confident.**

**B – Be clear and concise. There are no extra points for being verbose or writing extra.**

**C –Only use the white pages that I will provide. You have 60 minutes to answer the quiz.**

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**Problem 1 (Katz)**

Two particles A and B with equal charges accelerated through potential differences V and 3V, respectively, enter a region with a uniform magnetic field. The particles move in circular paths of radii R and 2R, respectively. Determine the ratio of the masses of particles A and B.

**Problem 2 (The Hall effect)**

A rectangular silver strip is 2.50 cm wide and 0.050 cm thick. It is in a magnetic field perpendicular to its surface (figure below). The magnetic field is uniform, with a magnitude of 1.75 T. The strip carries a current of 6.45 A. The number density of charge carriers in silver is 5.86 X 10^8 m^(-3). Consider that there are protons moving in the direction of the current and electrons moving in the opposite direction. There will be a charge separation between electron and protons that will create a voltage in the horizontal direction (the magnetic force will balance with the electrostatic force). Find the voltage between the left and the right end of the strip.

A diagram of a graph

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**Problem 3**

In a laboratory, you measure the magnitude of the magnetic field generated by a long wire, and you plot your results—B as a function of position r. Rank this graph (a,b, and c) with respect to how many loops the wire does (the current I through earch wire is the same):

A graph of a rectangle and a rectangle with arrows

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