**Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**PHY2049C, Quiz 5**

**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 50 minutes to answer the quiz.**

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**Problem 1**

Figure 1 shows a rectangular solid conductor of edge lengths *L*, 2*L*, and 3*L*.A potential difference *V* is to be applied uniformly between pairs of opposite faces of the conductor as in Figure 2 (The potential difference is applied between the entire face on one side and the entire face on the other side.) First *V* is applied between the left–right faces, then between the top–bottom faces, and then between the front–back faces. Rank those pairs, greatest first, according to the following (within the conductor): (a) the conductivity (b) the resistance (c) the drift velocity of particles.

A rectangular object with text

AI-generated content may be incorrect.

Figure 1

A close-up of a vent

AI-generated content may be incorrect.

Figure 2: Potential difference is applied across an entire face

**Problem 2**

If you had 10 grams of copper, what is the maximum capacitance you can get? The minimum allowed plate separation is 1mm. The thickness of the plates must be 1mm. The density of copper is 8.96 g/cm³ (Consider the three different capacitor shapes we discussed in class, what would give you the maximum capacitance?)

**Problem 3**

On Day 1, there were 490 kids in two groups. Group A consistent only of boys, and B only of girls. There were 2 and a half more girls than boys. On Day 2, more girls joined group B and more boys joined group A. For each 4 boys in group A, 32 boys joined group A. The total number of girls resulted in 1/3 that of boys. Express the number of girls that joined group B in terms of a fraction of the boys that joined group A on Day 2.