Name_____

Physics 111 Quiz #2, September 23, 2022

Please show all work, thoughts and/or reasoning in order to receive partial credit. The quiz is worth 10 points total.

I affirm that I have carried out my academic endeavors with full academic honesty.

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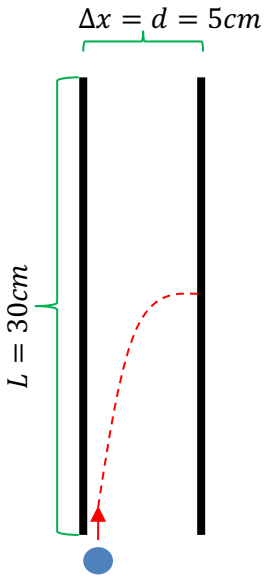
1. Consider the accelerator shown below in which two parallel metal plates have a potential difference of $\Delta V = -10kV$ across them. A proton (initially located at the lower plate) is accelerated from rest and emerges from the hole in the top plate with a vertical velocity. What is the speed of the proton when it leaves the hole in the upper plate?

2. Suppose the proton is then incident on a second set of plates shown below. The proton enters this set of plates at the left plate at the point $(x, y) = (0,0)$ and suppose that the proton strikes the right plate at a point $(x, y) = \left(d, \frac{L}{2}\right)$ above where it enters. How long does it take the proton to strike the right plate from the time it enters the field?



3. What electric field, magnitude and direction, would be needed to achieve the scenario in question 2?

4. What potential difference was applied across the set of plates in question 2?

5. What was the change in electric potential energy for the proton in part 2, in keV?