Physics 112
Quiz #6
September 18, 2000

Name: _____

1. Two parallel metal plates are connected to a battery. The left-side plate is connected to the positive terminal. A 2-C charge is held at rest somewhere between the plates, and then released. When it strikes the right-side plate, its kinetic energy is 6 J, and its potential energy is 0 J. What was its potential energy just before it was released?

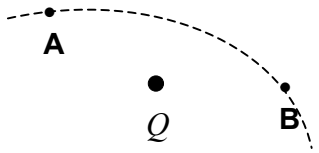
   A. 0 J
   B. 1 J
   C. 2 J
   D. 3 J
   E. 6 J
   F. 12 J

2. You are told to measure the electric field in an ***empty*** room where the electric field is known to be ***uniform and unchanging*** throughout the room. You find that a particle with a 3-C charge, placed 1 m from the center of the room, experiences a force of 9 N pointing south. After you leave, taking your particle with you, someone else enters the room and makes force measurements on a particle with a charge of –6 C. If they place their particle at a point two meters from the center of the room, they should report that the electric field in the room is:

   A. 1.5 N/C pointing north
   B. 1.5 N/C pointing south
   C. 3.0 N/C pointing north
   D. 3.0 N/C pointing south
   E. 6.0 N/C pointing north
   F. 6.0 N/C pointing south
   G. 9.0 N/C pointing north
   H. 9.0 N/C pointing south
   I. 12.0 N/C pointing north
   J. 12.0 N/C pointing south

3. Points *A* and *B* are both the same distance from charge *Q*, which is fixed in position and can not move. Another charge *–q* is fired by a gun into the area near *Q* and travels along the dashed line path that is shown. The charge *–q* moves through *A* and then on through *B*, continuing on its way. When it passes by *A*, its speed is 10 m/s. When it passes by *B*, what will be its speed?

   A. less than 10 m/s
   B. 10 m/s
   C. more than 10 m/s
   D. there is not enough information to answer this



4. Two parallel metal plates are 8 m apart, and connected to a battery. The electric field magnitude between the plates is 4 N/C. A 2-C charge is held at rest on the positive plate, and then released. What is its kinetic energy when it strikes the negative plate? *No partial credit. Your answer must be within 10% of the correct answer to receive credit. Units missing or incorrect: –1 point.*

Answer: _____