Electric Potential and Potential Energy, Uniform Fields

**For the following questions assume motion is parallel to the electric field, if not stated otherwise.**

1. It takes 8.0x10-7J of work to move a +4.0nC charge 2.00mm to the right (at constant speed) in a uniform electric field. Find the electric field in the region.

2. It takes 8.0x10-7J of work to move a -4.0nC charge 2.00mm to the right (at constant speed) in a uniform electric field. Find the electric field in the region.

3. The electric field in a region of space is uniform and **E**=24000N/C up.

61mm 19mm

A B

14mm

C D

Find: A. VA-VB  B. VB-VA

C. VA-VC D. VC-VA

E. VC-VD F. VD-VC

G. VB-VD H. VD-VB

I. VA-VD J. VD-VA

K. VB-VC L. VC-VB

4. Two parallel plates each have an area of 8.0x10-4m2. The plates are separated by 2.00mm, and are given equal charges of opposite polarities. The field between the plates is 975N/C from plate B to plate A.

A. Which plate is positively charged?

B. How much positive charge is on the positive plate?

C. How much charge is on the negative plate?

D. What is the potential difference VA-VB?

5. An electron is released from rest at the negative plate of a parallel plate capacitor. The electron exits through an itty-bitty-teeny-weeny hole in the positive plate at 2.5x106m/s. Each plate is a rectangle measuring 4.00cm by 3.00cm.

A. Find the potential difference between the plates.

B. Find the charge stored on the plates.

C. How many excess electrons are on the negative plate?

D. If the plates are separated by 1.20mm, find the magnitude of the electric field between the plates.