V, U_E, Uniform Fields

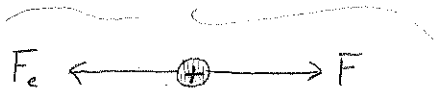
FUN FOR ALL AGES!!

1. $W = \vec{F}\vec{d} = qEd$

$E = 100\ N/C$

$\vec{E} = 1.0 \times 10^2\ N/C$ LEFT

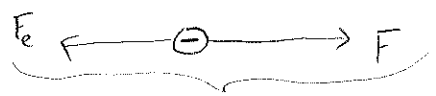
$\vec{F}_e$ is left, q is +
so $\vec{E}$ is left



2. $W = \vec{F}\vec{d} = qEd$

$E = 100\ N/C$

$\vec{E} = 1.0 \times 10^2\ N/C$ RIGHT



$\vec{F}_e$ is left, q is −
so $\vec{E}$ is right.

3.

A. 0V	B. 0V	C. −340V	D. 340V
E. 0V	F. 0V	G. −340V	H. 340V
I. −340V	J. 340V	K. −340V	L. 340V

4. A. Plate B

B. $E = \frac{Q}{\epsilon_0 A} \Rightarrow Q = E\epsilon_0 A = 6.9 \times 10^{-12}\ C$

C. $-6.9 \times 10^{-12}\ C$

D. $\Delta V = Ed = 1.95V = 2.0V \Rightarrow$ Now, we know $V_B > V_A$

so $V_A - V_B = -2.0V$

5. A. $W_{nc}^{\,0} = \Delta K + \Delta U_e$

$\Delta K = -\Delta U_e$

$K - K_0^{\,0} = -q\Delta V$

$\frac{1}{2}mv^2 = -q\Delta V$

$\Delta V = \frac{\frac{1}{2}mv^2}{-q} = 17.792$

$\Delta V = 18V$

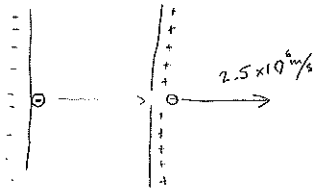
B. $E = \frac{\Delta V}{d} = \frac{Q}{\epsilon_0 A}$

$Q = \frac{\Delta V \epsilon_0 A}{d}$

$Q = 1.6 \times 10^{-10}\ C$

C. $N = \frac{Q}{e}$

$N = 9.8 \times 10^8$ electrons



D. $E = \frac{\Delta V}{d} = 15000\ N/C$