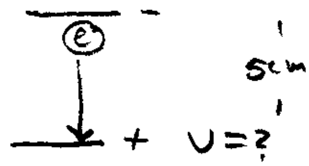
3) 

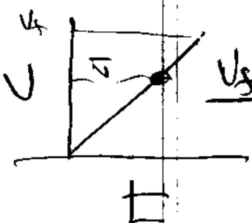
$\Delta t = 2.0\times10^{-6}$ sec

a) Ignore gravity as electric forces are much stronger

b) $v = ?$

This is uniform acceleration since this is constant force

$x = \frac{1}{2}at^2 \Rightarrow a = \frac{2x}{t^2} = \frac{2(5\times10^{-2}m)}{(2.0\times10^{-6}sec)^2} = \frac{10^{-1}\ m}{4\times10^{-12}\ sec^2}$



$\underline{v_f = 2\bar{v}}$

$\underline{a = 0.25\times10^{+11}\ m/s^2}$ (so OK to ignore g)

$d = \bar{v}t$

$\bar{v} = d/t,\ v = 2\bar{v} = 2d/t$

$v = at = (0.25\times10^{11}\frac{m}{s^2})(2.0\times10^{-6}sec) = 0.5\times10^{5}\ m/s^2$

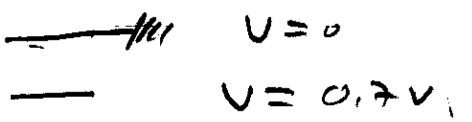
c) $F = Ee$

$ma = Ee \Rightarrow E = \frac{ma}{e} = \frac{(9.11\times10^{-31}\ kg)(0.25\times10^{11}\ m/s^2)}{1.6\times10^{-19}C} = 0.14\ \frac{N}{C}$

up.

The direction is $\underline{\text{opposite}}$ to direction of motion (e have −q)

d) $\Delta V = Ed = (.14\frac{N}{C})(5\times10^{-2}m) = \underline{0.7\ \text{Volts}}$



e)