$V_C = -600V$

$V_A = 400V$

$\rightharpoondown A \longleftarrow 2m \rightarrow C$

$E = 500 \frac{V}{m}$

$\boxed{} \rightarrow F_{\vec{E}}$

dr

3 m

B

$V_B^{\uparrow} = 400V$

Work done $A \rightarrow B$:

$$E \cdot d = 0$$

$$F_{\vec{E}} \perp dr \Rightarrow \text{no work}$$

$A \rightarrow C$:

$$\Delta V = -\vec{E} \cdot \vec{d}$$

$$\Delta V = -500 \cdot 2$$

$$V_C = 400 - 1000 = -600 V$$

Work when electron moved from $B \rightarrow C$:

$\rightarrow$ Field does $\ominus$ work (moving an e^- from high $\rightarrow$ low potential)

$$W_{field} = -q \Delta V$$

$$W_{field} = -(-1e)(-1000 V)$$

$$= -1000 \, eV$$