**CW 13.10 – Electron Paths Name: ……………………………………**



An electron initially moves in a horizontal direction and has a kinetic energy of 2.0 x 103 eV when it is in the position shown above. It passes through a uniform electric field between two oppositely charged horizontal plates (region I) and a field‑free region (region II) before eventually striking a screen at a distance of 0.08 m from the edge of the plates. The plates are 0.04 m long and are separated from each other by a distance of 0.02 m. The potential difference across the plates is 250 V. Gravity is negligible.

1. Calculate the initial speed of the electron as it enters region I. (2)
2. Calculate the magnitude of the electric field *E* between the plates, and indicate its direction on the diagram above. (2)
3. Calculate the magnitude of the electric force *F* acting on the electron while it is in region I. (2)
4. On the diagram below, sketch the path of the electron in regions I and II. For each region describe the shape of the path. (2)



1. Calculate the vertical distance from the centre-line that the electron strikes the screen. (3)