6 **(a)** Explain how electric and magnetic fields are used in velocity selection for charged particles. You may draw a diagram if you wish.

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..... [4]

(b) A proton enters a velocity selector with a speed of $8.6 \times 10^5\,\text{m s}^{-1}$.

The electric field in the velocity selector is produced by parallel plates positioned 3.0 cm apart with a potential difference (p.d.) of 410 V between them.

Calculate the magnetic flux density of the magnetic field required for this proton to be selected.

magnetic flux density = ... T [3]