3 **(a)** Define *electric field strength.*

.....

.....[1]

(b) An electron is accelerated from point A to point B by a uniform electric field, as illustrated in Fig. 3.1.

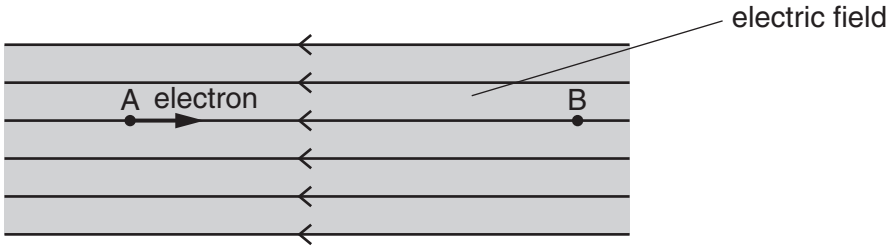

Fig. 3.1

The distance between A and B is 12 mm. The velocity of the electron at A is 2.5 km s^{-1} and at B is 18 Mm s^{-1}.

Calculate

(i) the acceleration of the electron,

acceleration = ...m s^{-2} [2]

(ii) the change in kinetic energy of the electron,

change in kinetic energy = ...J [3]

(iii) the electric field strength.

electric field strength = ... $V\,m^{-1}$ [3]

(c) An α-particle moves from A to B in the electric field in **(b)**.

Describe and explain how the change in the kinetic energy of the α-particle compares with that of the electron. Numerical values are not required.

.....

.....

.....

.....

.....[3]

[Total: 12]