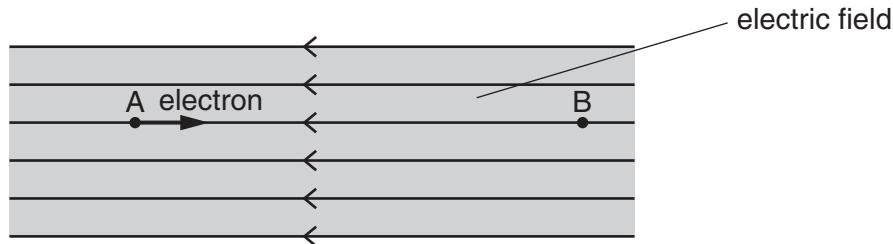


- 3 (a) Define *electric field strength*.

.....  
..... [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  $2.5 \text{ km s}^{-1}$  and at B is  $18 \text{ Mm s}^{-1}$ .

Calculate

- (i) the acceleration of the electron,

$$\text{acceleration} = \dots \text{ms}^{-2} [2]$$

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

$$\text{change in kinetic energy} = \dots \text{J} [3]$$

- (iii) the electric field strength.

electric field strength = ..... V m<sup>-1</sup> [3]

- (c) An  $\alpha$ -particle moves from A to B in the electric field in (b).

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

.....  
.....  
.....  
.....  
.....

[3]

[Total: 12]