

- 7 (a) Explain what is meant by an *electric field*.

.....  
 .....[1]

- (b) A uniform electric field is produced between two vertical metal plates AB and CD, as shown in Fig. 7.1.

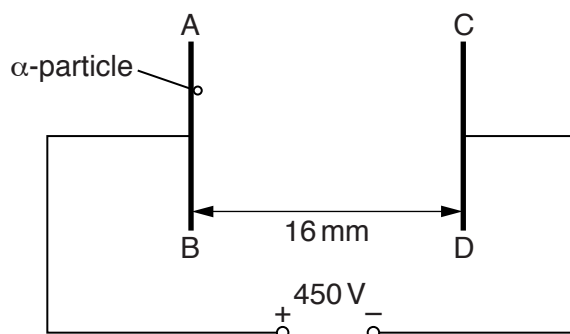


Fig. 7.1

The potential difference between the plates is 450V and the separation of the plates is 16 mm.

An  $\alpha$ -particle is accelerated from plate AB to plate CD.

- (i) On Fig. 7.1, draw lines to represent the electric field between the plates. [2]  
 (ii) Calculate the electric field strength between the plates.

electric field strength = .....  $\text{V m}^{-1}$  [2]

- (iii) Calculate the work done by the electric field on the  $\alpha$ -particle as it moves from AB to CD.

work done = ..... J [3]

Question 7 continues on page 16.

(iv) A  $\beta$ -particle moves from AB to CD. Calculate the ratio

$\frac{\text{work done by the electric field on the } \alpha\text{-particle}}{\text{work done by the electric field on the } \beta\text{-particle}}.$

Show your working.

ratio = ..... [1]