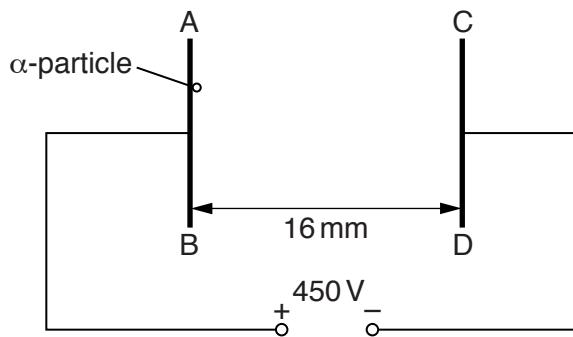


- 7 (a) Explain what is meant by an *electric field*.

.....  
.....

- (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 16mm.

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.

$$\text{electric field strength} = \dots \text{Vm}^{-1} [2]$$

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

$$\text{work done} = \dots \text{J} [3]$$

**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]

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