10.1 Electric Fields

Question Paper

Course	CIE A Level Physics (9702) 2019-2021
Section	10. Electric Fields
Topic	10.1 Electric Fields
Difficulty	Hard

Time allowed: **10**

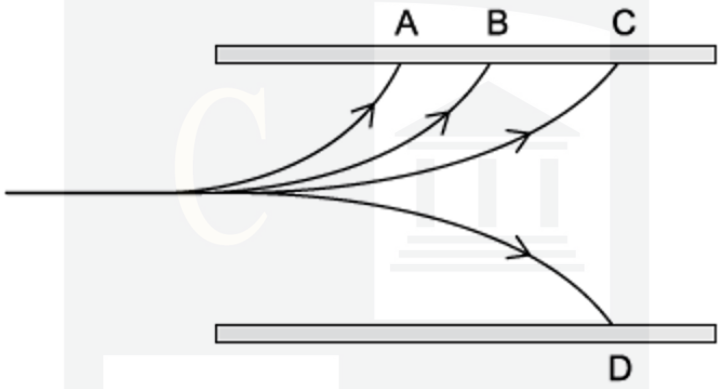
Score: **/4**

Percentage: **/100**

Question 1

A single proton travelling with a constant horizontal velocity enters a uniform electric field between two parallel charged plates. In the diagram, **B** shows the path taken by the proton.

Which path is taken by a helium nucleus that enters the electric field at the same point and with the same velocity as the proton?

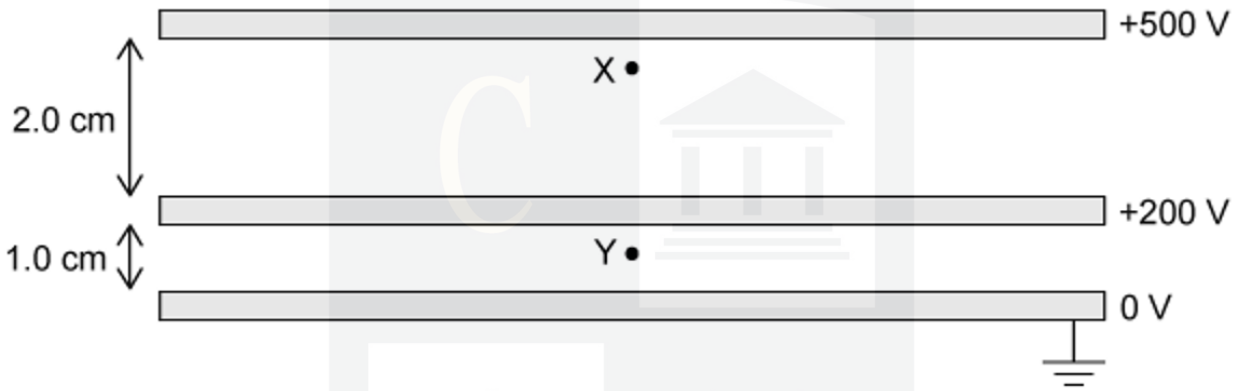


[1 mark]

Question 2

Three parallel metal plates of the same area are fixed with a separation of 2.0 cm between the top plate and the centre plate, and 1.0 cm between the centre plate and the bottom plate.

The top plate is held at a potential of +500 V, the middle plate at +200 V and the bottom plate is earthed, as shown.



What is the value of the ratio $\frac{magnitude\ of\ force\ on\ an\ electron\ at\ X}{magnitude\ of\ force\ on\ an\ electron\ at\ Y}$?

A 0.75 **B** 1.00 **C** 1.25 **D** 1.50

[1 mark]

Question 3

A microscopic oil drop of mass 1.1×10^{-12} kg and charge $3e$ is suspended in the gap between two parallel metal plates. The separation between the plates is 10.68 mm.

Calculate the potential difference between the plates to the nearest kV.

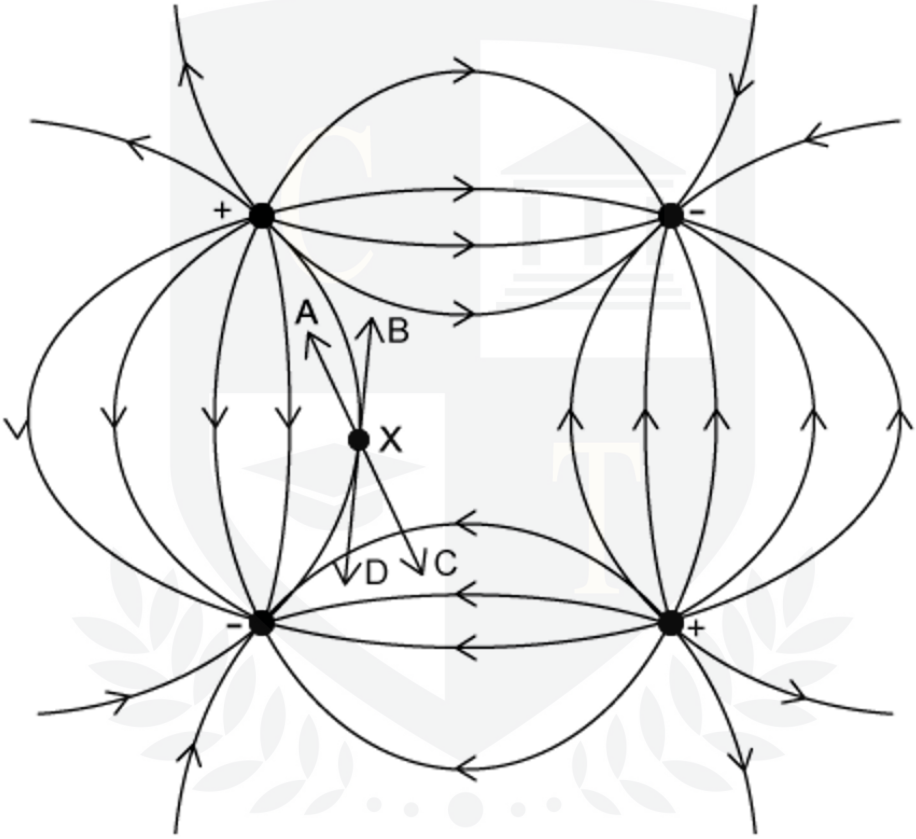
A 120 kV **B** 240 kV **C** 480 kV **D** 720 kV

[1 mark]

Question 4

The diagram shows an electric field pattern caused by two positive and two negative point charges of equal magnitude placed at the four corners of a square.

In which direction does the force act on an electron at point X?



[1 mark]