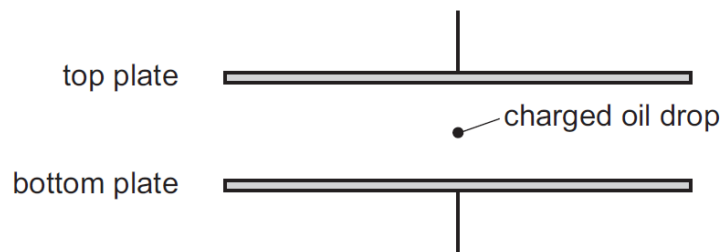


## Electric fields – 2021 AS

### 1. June/2021/Paper\_11/No.11

A charged oil drop is held stationary between two charged parallel plates.



Which forces act on the oil drop?

- A both electric and gravitational
- B electric only
- C gravitational only
- D neither electric nor gravitational

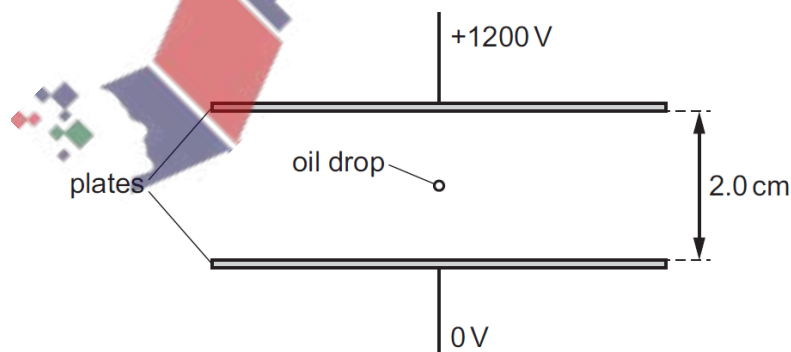
### 2. June/2021/Paper\_11/No.30

What is the electric field strength in a region where a proton accelerates at  $2.00 \text{ m s}^{-2}$  due to the field?

- A  $11.4 \text{ pV m}^{-1}$
- B  $5.22 \text{ nV m}^{-1}$
- C  $10.4 \text{ nV m}^{-1}$
- D  $20.9 \text{ nV m}^{-1}$

### 3. June/2021/Paper\_11/No.31

An oil drop of mass  $2.6 \times 10^{-15} \text{ kg}$  and with a charge of  $-4.8 \times 10^{-19} \text{ C}$  is in a vacuum between two horizontal plates. The plates have a separation of  $2.0 \text{ cm}$  and a potential difference (p.d.) between them of  $1200 \text{ V}$ , as shown.



Which statement describes the motion of the oil drop?

- A It is stationary.
- B It has a downward acceleration of  $9.7 \text{ m s}^{-2}$ .
- C It has an upward acceleration of  $1.3 \text{ m s}^{-2}$ .
- D It has an upward acceleration of  $11 \text{ m s}^{-2}$ .

4. June/2021/Paper\_12/No.11

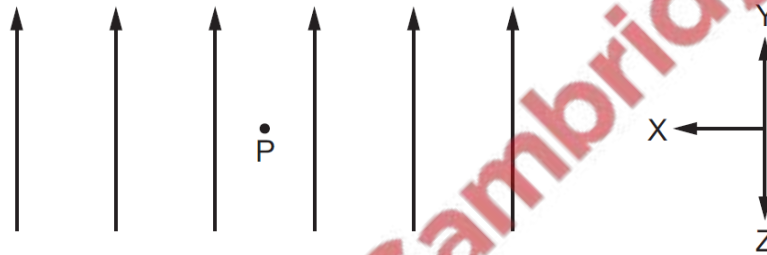
A charged particle is placed in a uniform field of force. The direction of the force on the particle is opposite to the direction of the field.

What is the field and what is the charge on the particle?

	field	charge on particle
A	electric	negative
B	electric	positive
C	gravitational	negative
D	gravitational	positive

5. June/2021/Paper\_12/No.30

A positively charged particle P is in an electric field, as shown.



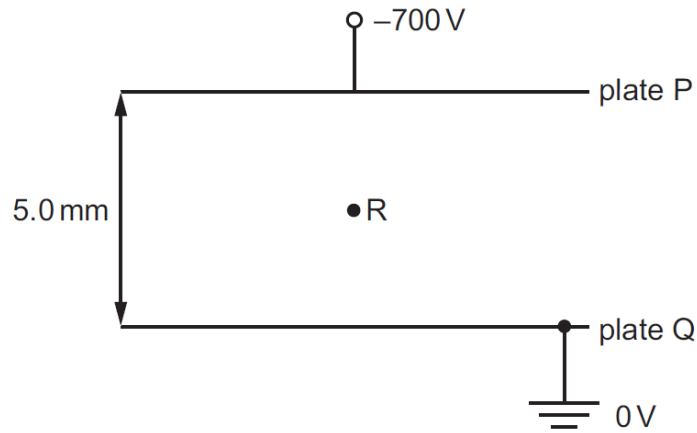
The field lines (lines of force) are evenly spaced and parallel.

Which statement is correct?

- A Moving P a small distance in any direction will not change the electric force on P.
- B Moving P a small distance in direction Y will increase the electric force on P.
- C Moving P a small distance in direction Z will increase the electric force on P.
- D Moving P a small distance in direction X will increase the electric force on P.

6. June/2021/Paper\_12/No.31

The diagram shows two parallel metal plates P and Q, separated by a distance of 5.0 mm. There is a potential difference of 700 V between the plates. Plate Q is earthed.



What is the magnitude and direction of the electric field at point R?

- A  $1.4 \times 10^2 \text{ NC}^{-1}$  from P towards Q
- B  $1.4 \times 10^2 \text{ NC}^{-1}$  from Q towards P
- C  $1.4 \times 10^5 \text{ NC}^{-1}$  from P towards Q
- D  $1.4 \times 10^5 \text{ NC}^{-1}$  from Q towards P

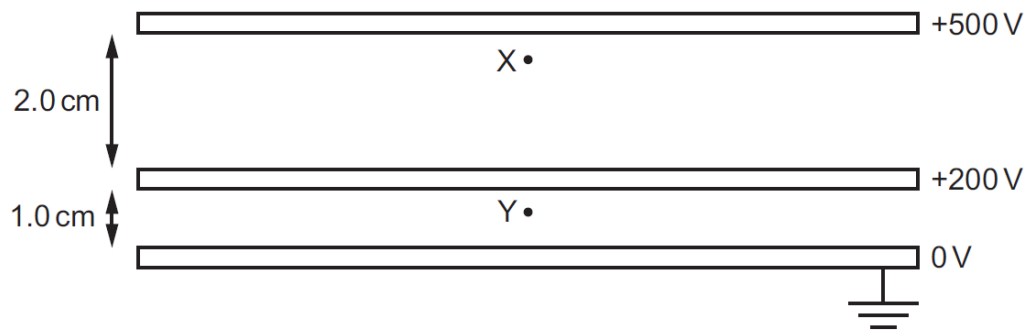
7. Nov/2021/Paper\_11/No.30

What is meant by electric field strength?

- A force per unit charge acting on a small mass
- B force per unit charge acting on a small positive charge
- C force per unit mass acting on a small mass
- D force per unit mass acting on a small positive charge

8. Nov/2021/Paper\_11/No.31

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



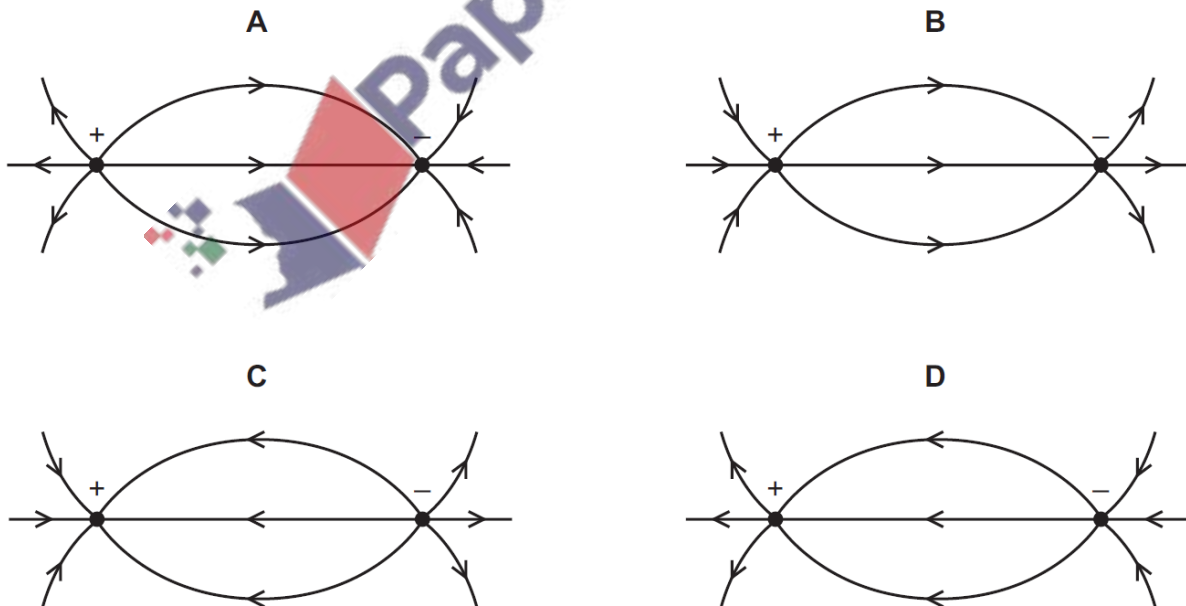
What is the value of the ratio  $\frac{\text{magnitude of force on an electron at X}}{\text{magnitude of force on an electron at Y}}$ ?

- A 0.75      B 1.00      C 1.25      D 1.50

9. Nov/2021/Paper\_12/No.31

Four diagrams representing the electric field between two oppositely charged point charges are shown.

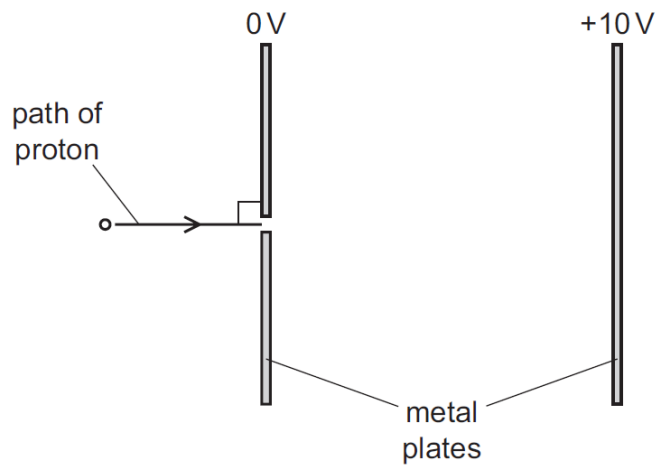
Which diagram correctly shows the electric field lines?



10. Nov/2021/Paper\_12/No.32

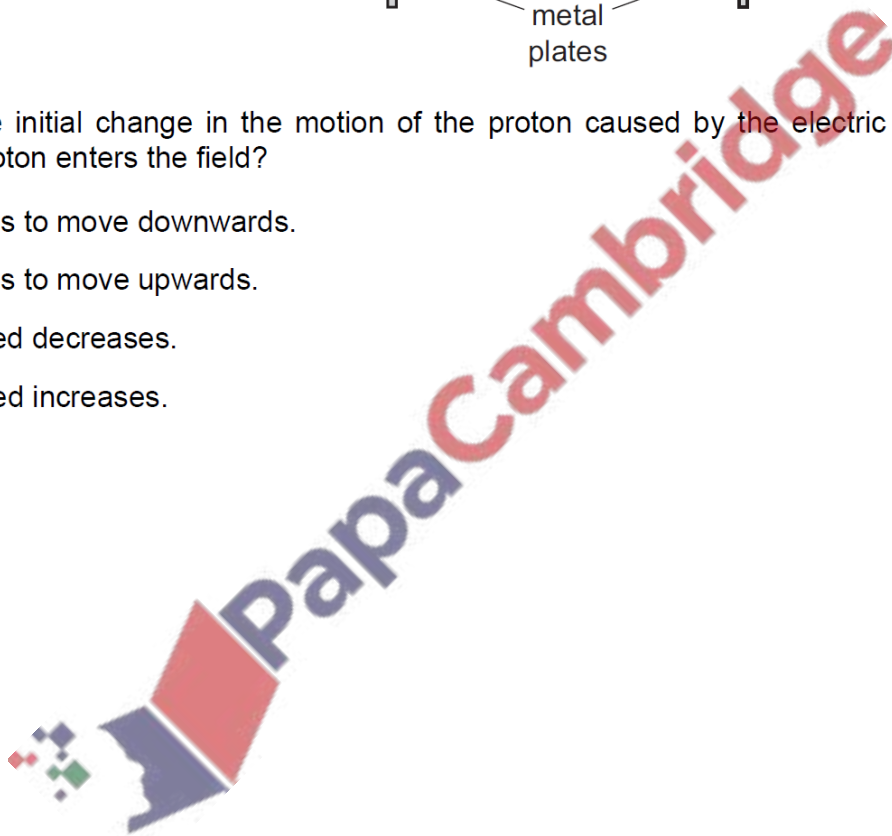
A proton enters the uniform electric field between two parallel vertical metal plates in a vacuum.

One plate is at a potential of 0 V and the other plate is at a potential of +10 V, as shown.



What is the initial change in the motion of the proton caused by the electric field, immediately after the proton enters the field?

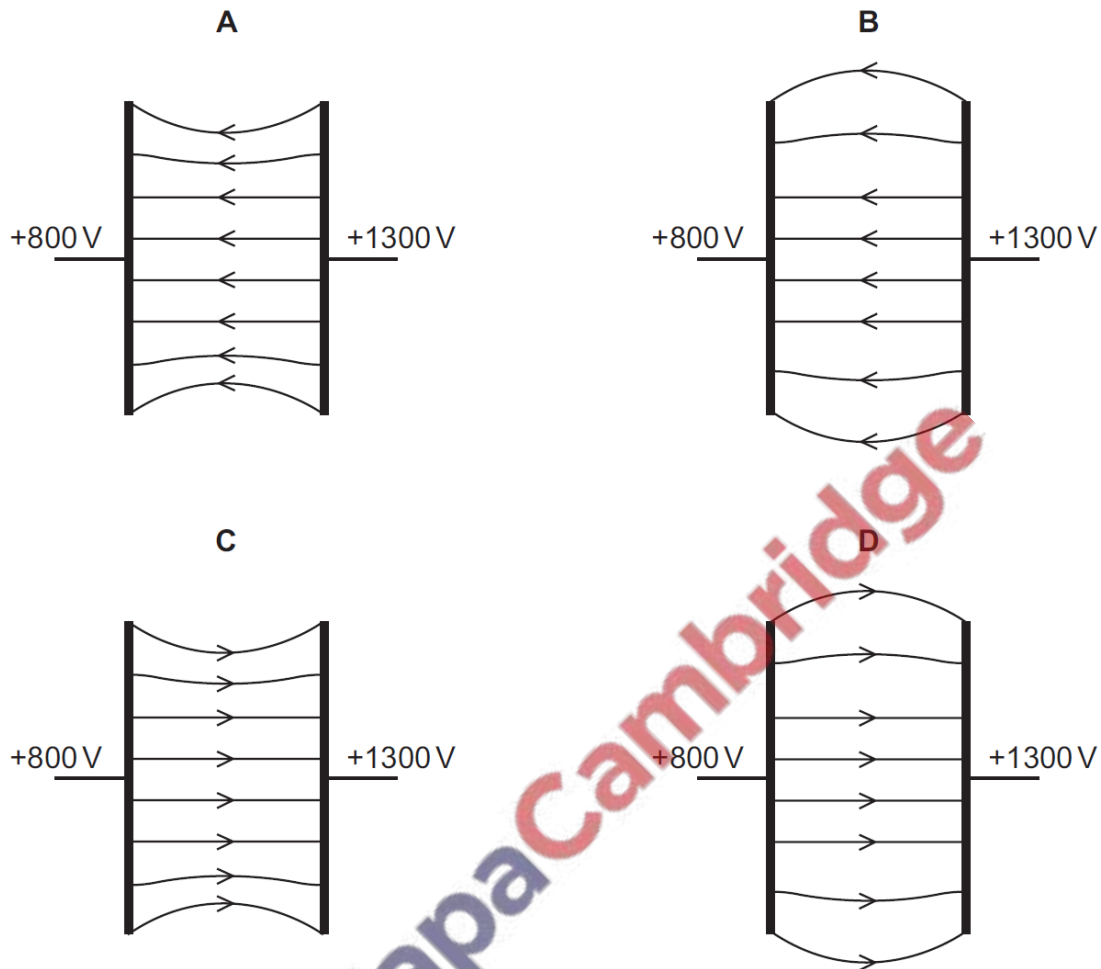
- A It begins to move downwards.
- B It begins to move upwards.
- C Its speed decreases.
- D Its speed increases.



11. Nov/2021/Paper\_13/No.31

Two parallel metal plates are at electric potentials of +800 V and +1300 V.

Which diagram best represents the electric field between the metal plates?



12. Nov/2021/Paper\_13/No.32

An electron is in a uniform electric field of field strength  $1500 \text{ V m}^{-1}$ .

What is the acceleration of the electron due to the electric field?

- A  $8.5 \times 10^{-9} \text{ ms}^{-2}$
- B  $1.6 \times 10^{-5} \text{ ms}^{-2}$
- C  $1.4 \times 10^{11} \text{ ms}^{-2}$
- D  $2.6 \times 10^{14} \text{ ms}^{-2}$

13. Nov/2021/Paper\_13/No.33

A lightning strike transfers  $1 \times 10^{20}$  electrons past a point in a time of  $30 \mu\text{s}$ .

What is the average current during the lightning strike?

A 0.5 mA

B 0.5 A

C 500 A

D 500 kA

