30 A diffraction grating and a screen are used to determine the single wavelength λ of the light from a source.

What is an essential feature of this experiment?

A A curved screen must be used.

B The diffraction angle θ must be measured for at least two interference maxima.

C The light waves incident on the grating must be coherent.

D The third order intensity maximum must be produced.

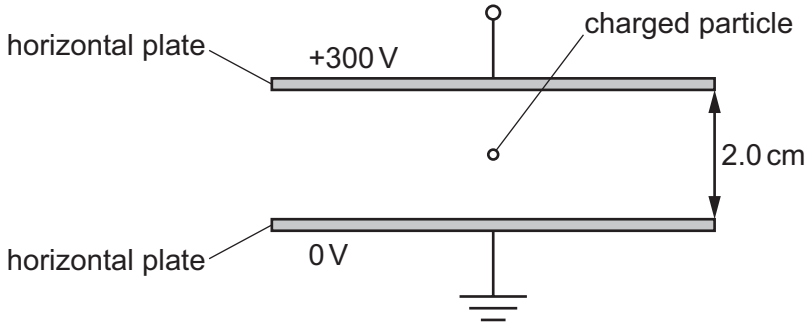
31 A small charge q is placed in the electric field of a large charge Q.

Both charges experience a force F.

What is the electric field strength of the charge Q at the position of the charge q?

A $\frac{F}{Qq}$ **B** $\frac{F}{Q}$ **C** FqQ **D** $\frac{F}{q}$

32 A charged particle is in a vacuum between two horizontal metal plates as shown.



The acceleration of the particle is $7.15 \times 10^{11}\,\text{m s}^{-2}$ downwards. The particle has a mass of $3.34 \times 10^{-27}\,\text{kg}$.

What is the charge on the particle?

A $+1.6 \times 10^{-19}\,\text{C}$

B $-1.6 \times 10^{-19}\,\text{C}$

C $+1.6 \times 10^{-17}\,\text{C}$

D $-1.6 \times 10^{-17}\,\text{C}$