

- 30 Light of wavelength $5.30 \times 10^{-7} \text{ m}$ is incident normally on a diffraction grating. The first-order maximum is observed at an angle of 15.4° to the direction of the incident light.

What is the angle between the first-order and second-order diffraction maxima?

- A 7.7° B 15.4° C 16.7° D 32.1°

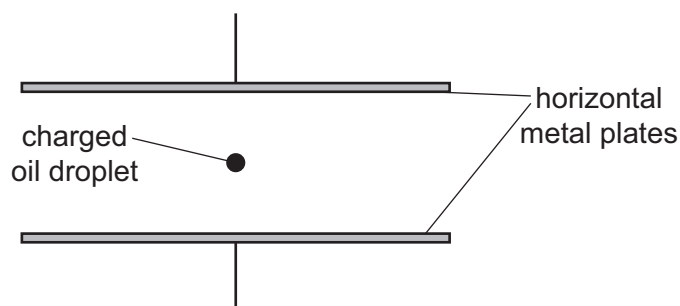
- 31 A stationary particle is in an electric field.

The only force on the particle is that from the electric field.

In which case is the electric field strength $5.0 \times 10^5 \text{ V m}^{-1}$?

- A a force of $1.6 \times 10^{-14} \text{ N}$ acting on an electron
B a force of $3.2 \times 10^{-14} \text{ N}$ acting on an alpha-particle
C a force of $8.0 \times 10^{-14} \text{ N}$ acting on an alpha-particle
D a force of $8.0 \times 10^{-14} \text{ N}$ acting on a proton

- 32 A constant potential difference is applied between two horizontal metal plates. A charged oil droplet is held stationary by the electric field between the plates.



As some of the oil evaporates, the droplet loses mass and starts to accelerate. Its charge remains constant.

In which direction does the droplet accelerate, and which change needs to be made to the separation of the plates in order to stop this acceleration?

	direction of acceleration	separation of the plates
A	downwards	decrease
B	downwards	increase
C	upwards	decrease
D	upwards	increase