28 In a two-source interference experiment, light of a single frequency is incident on a double slit.

The light waves emerging from the slits are coherent.

What is meant by *coherent*?

A The waves are in phase.

B The waves have a constant phase difference.

C The waves have the same amplitude.

D The waves interfere constructively wherever they overlap.

29 A parallel beam of light consists of light of wavelength 420 nm and light of wavelength 630 nm.

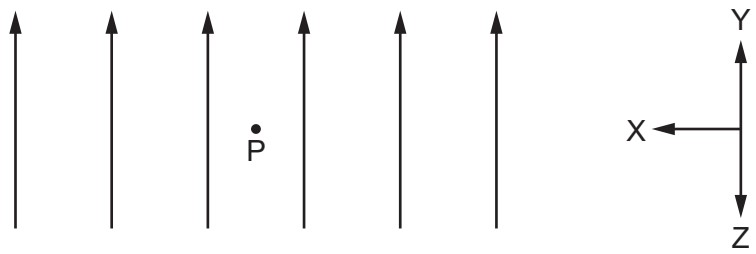
The light is incident normally on a diffraction grating.

The diffraction maxima for the two wavelengths overlap only at an angle of 31° from the direction of the incident light beam.

What could be the line spacing of the diffraction grating?

A 1.2 μm **B** 1.6 μm **C** 2.4 μm **D** 3.7 μm

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.