

18 Parallel waves in a ripple tank are diffracted as they pass through a gap in a barrier.

Three changes that can be made to this arrangement are listed.

- 1 Decrease the wavelength of the waves.
- 2 Increase the amplitude of the waves.
- 3 Decrease the size of the gap.

Which changes will cause the shape of the diffracted waves to be less curved?

- A** 1, 2 and 3 **B** 1 and 3 only **C** 1 only **D** 2 and 3 only

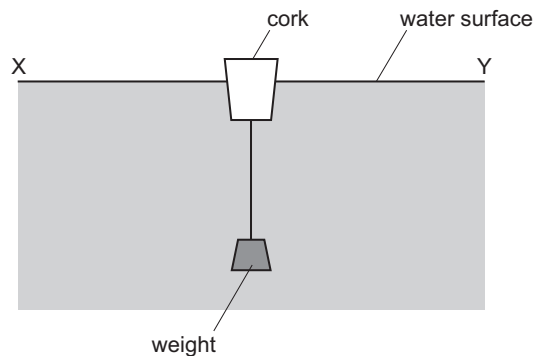
17 An earthquake-monitoring station records the arrival of 16 complete wavelengths of an earthquake wave in a time of 20 s.

The speed of the earthquake wave is 6.0 km/s.

What is the wavelength of the earthquake wave?

- A** 1.3×10^{-4} m **B** 2.1×10^{-4} m **C** 4.8×10^3 m **D** 7.5×10^3 m

17 The diagram shows a cork with a weight attached so that the cork floats upright in water.



Transverse waves travel across the water from X to Y.

In which direction do the waves make the cork move?

- A** $\rightarrow \leftarrow$ right and left
B $\uparrow \downarrow$ up and down
C $\rightarrow$ only to the right
D $\leftarrow$ only to the left

16 Which statement about waves is correct?

- A** Waves do not transfer either energy or matter.
B Waves transfer both energy and matter.
C Waves transfer energy without transferring matter.
D Waves transfer matter without transferring energy.

- 5 (a) Describe how a longitudinal wave differs from a transverse wave.

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..... [2]

- (b) Fig. 5.1 represents a seismic wave produced by an earthquake.

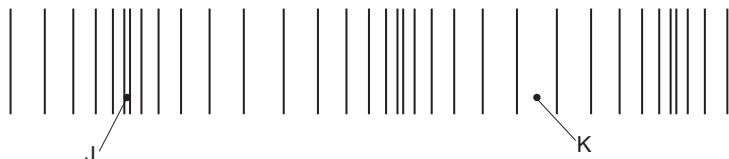


Fig. 5.1

- (i) State whether this seismic wave is a P-wave (primary) or an S-wave (secondary). Justify your choice.

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..... [1]

- (ii) The wave represented in Fig. 5.1 has a wavelength of 1.2×10^4 m.

Calculate the actual distance between point J and point K.

distance = [2]

- (iii) The wave in (ii) travels through the ground at a speed of 4600 m/s.

As the wave passes a certain point, the ground completes 5 oscillations.

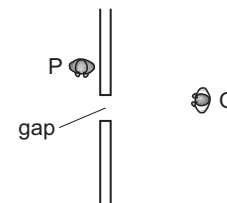
Calculate the time that it takes for the wave to pass. Show your working.

time = [3]

③

[Total: 8]

- 17 Two men, P and Q, stand close to a gap in a wall, as shown. Man P cannot see man Q but man P can hear man Q speaking.



Which statement explains this?

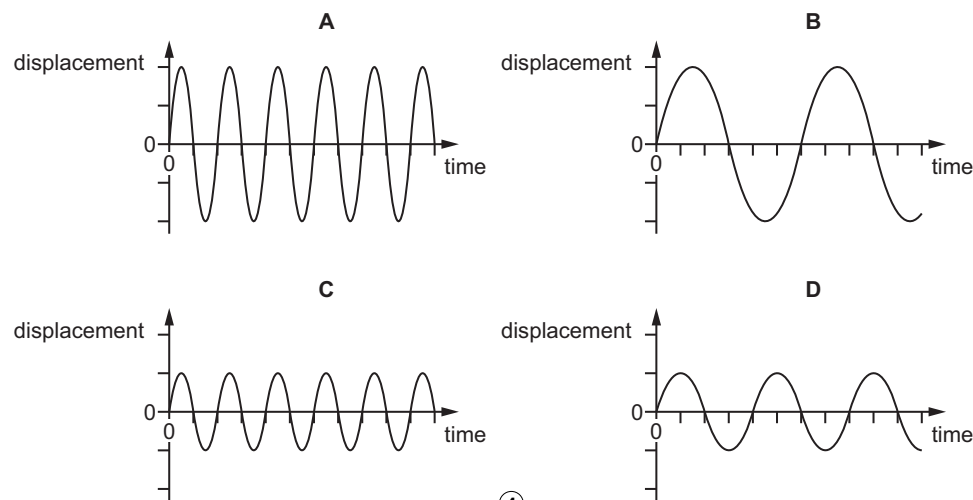
- A Light waves do not diffract at all because they are electromagnetic waves.
- B Light waves have a range of frequencies but sound has just one frequency.
- C Sound waves are of a higher frequency than light waves.
- D Sound waves diffract a lot because their wavelength is a similar size to the width of the gap.

- 18 Which quantities relating to a wave on the surface of water can **both** be measured in metres?

- A amplitude and frequency
- B amplitude and wavelength
- C amplitude and wave speed
- D frequency and wavelength

- 17 The diagrams show graphs of displacement against time for four waves. All the graphs are drawn to the same scale.

Which wave has the largest amplitude and the highest frequency?



④