

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

22 Ultraviolet radiation and infrared radiation are both parts of the electromagnetic spectrum.

However, they differ in wavelength and frequency.

Which row describes how they differ?

	ultraviolet	infrared
A	longer wavelength than infrared	higher frequency than ultraviolet
B	longer wavelength than infrared	lower frequency than ultraviolet
C	shorter wavelength than infrared	higher frequency than ultraviolet
D	shorter wavelength than infrared	lower frequency than ultraviolet

23 A police car with its siren sounding is stationary in heavy traffic. A pedestrian notices that, although the loudness of the sound produced does **not** change, the pitch varies.

Which row describes the amplitude and the frequency of the sound?

	amplitude	frequency
A	constant	constant
B	constant	varying
C	varying	constant
D	varying	varying

- 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

- 23** Sound travels through air as a series of compressions and rarefactions.

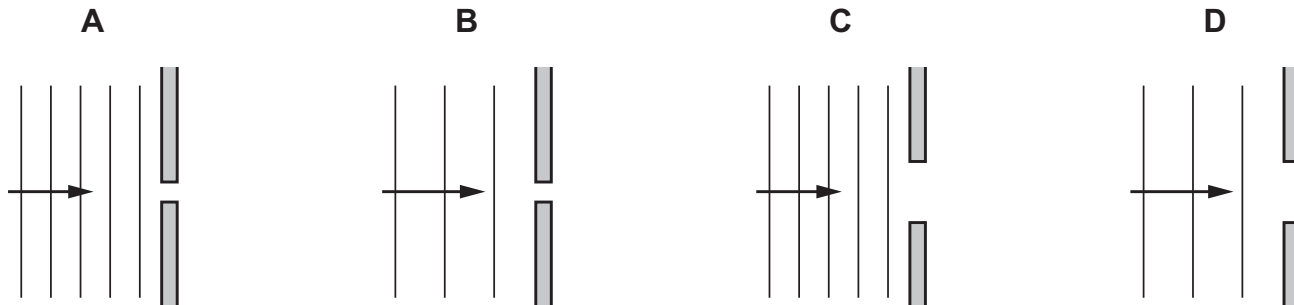
Which statement correctly compares a compression with a rarefaction?

- A** In a compression, the wavelength is longer than in a rarefaction.
B In a compression, the wavelength is shorter than in a rarefaction.
C In a compression, the density of the air is greater than in a rarefaction.
D In a compression, the density of the air is lower than in a rarefaction.

- 18** When water waves pass through a gap, they diffract.

The diagrams show wavefronts approaching a gap.

In which diagram will the diffraction be least?



- 22** Visible light, X-rays and microwaves are all components of the electromagnetic spectrum.

Which statement about the waves is correct?

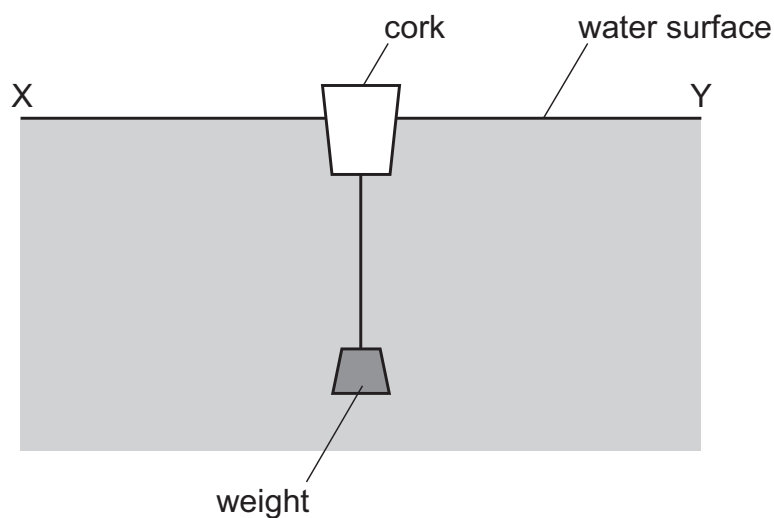
- A** In a vacuum, microwaves travel faster than visible light and have a shorter wavelength than visible light.
B In a vacuum, microwaves travel at the same speed as visible light and have a shorter wavelength than visible light.
C In a vacuum, X-rays travel faster than visible light and have a shorter wavelength than visible light.
D In a vacuum, X-rays travel at the same speed as visible light and have a shorter wavelength than visible light.

23 Both the amplitude and the frequency of a sound wave decrease.

What happens to the sound that is heard?

- A** The sound is louder and has a higher pitch.
- B** The sound is louder and has a lower pitch.
- C** The sound is quieter and has a higher pitch.
- D** The sound is quieter and has a lower pitch.

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** → ← right and left
- B** ↑↓ up and down
- C** → only to the right
- D** ← only to the left

22 Satellites are sometimes used to receive and re-transmit television signals.

Which row shows the type of satellite and the electromagnetic waves used?

	type of satellite	electromagnetic waves used
A	low orbit	infrared
B	low orbit	microwaves
C	geostationary	infrared
D	geostationary	microwaves