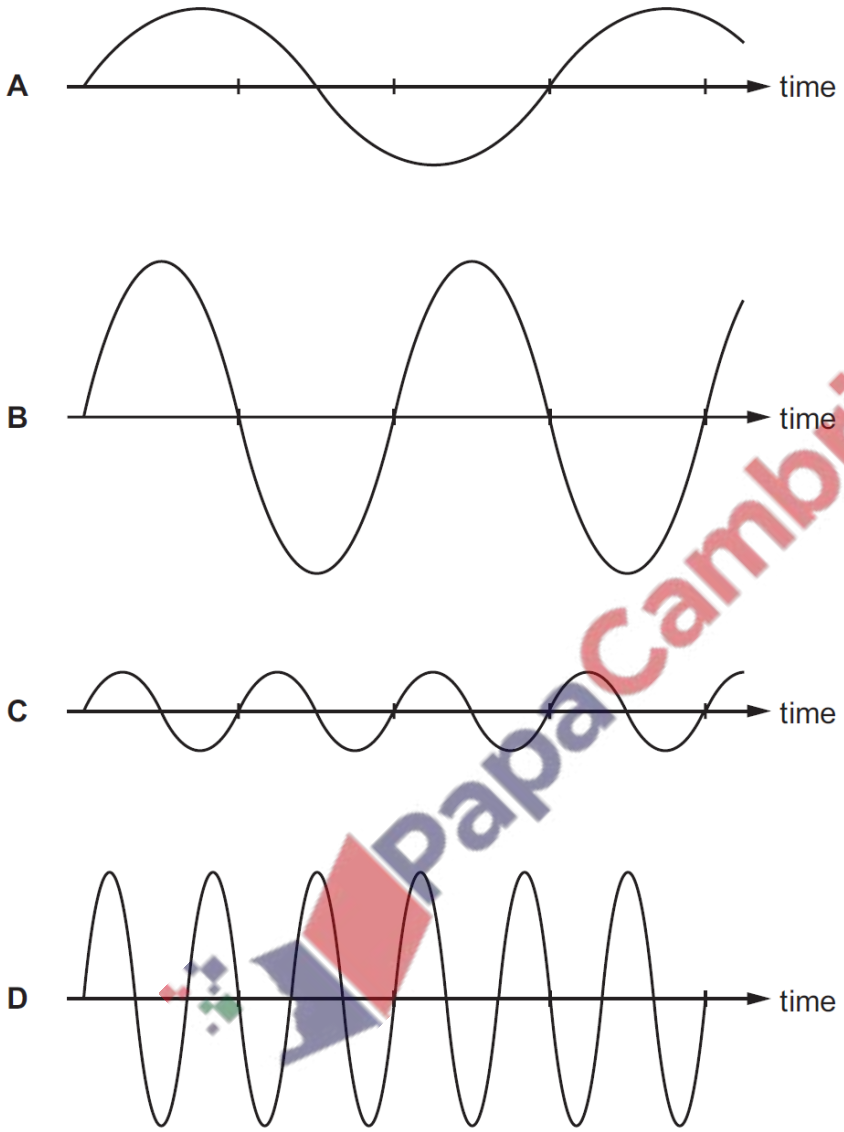
Sound – 2021 IGCSE 0625

1. June/2021/Paper_11,12&13/No.26

The diagrams represent the waves produced by four sources of sound. The scales are the same for all the diagrams.

Which sound has the highest frequency?



2. June/2021/Paper_12/No.25

Sound is a transfer of energy from an oscillating source.

Which statement describes how sound energy is transferred?

A a longitudinal wave with the oscillation parallel to the direction in which energy is transferred

B a longitudinal wave with the oscillation perpendicular to the direction in which energy is transferred

C a transverse wave with the oscillation parallel to the direction in which energy is transferred

D a transverse wave with the oscillation perpendicular to the direction in which energy is transferred

3. June/2021/Paper_13/No.27

Which description of ultrasound is correct?

A longitudinal waves with a frequency greater than 20 000 Hz

B longitudinal waves with a frequency less than 20 Hz

C transverse waves with a frequency greater than 20 000 Hz

D transverse waves with a frequency less than 20 Hz

4. June/2021/Paper_21/No.26

A sound wave is travelling outwards from a loudspeaker into the surrounding air.

Here are three statements.

1 The air pressure is lower at a rarefaction compared with undisturbed air.

2 The density of the air is less at a compression compared with undisturbed air.

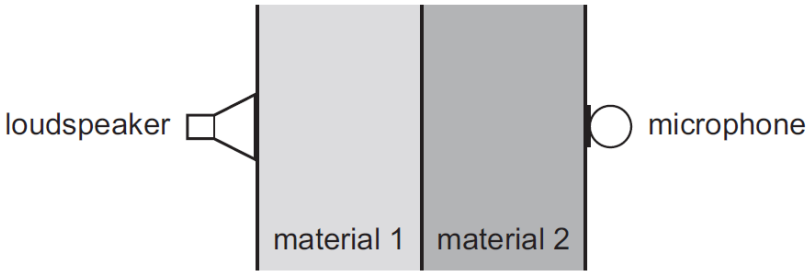
3 The distance from a compression to a rarefaction equals half a wavelength.

Which statements about the sound wave are correct?

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

5. June/2021/Paper_21,22&23/No.27,26

The sound from a loudspeaker must pass through two materials to reach a microphone.

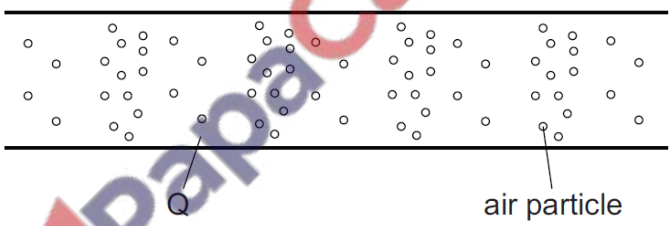


Which combination of materials gives the shortest time for the sound to reach the microphone?

	material 1	material 2
A	air	hydrogen
B	air	water
C	copper	aluminium
D	water	oil

6. June/2021/Paper_23/No.26

The diagram shows a model of a sound wave passing through air in an open tube.



What is the region Q?

A a compression which is a region of high pressure

B a compression which is a region of low pressure

C a rarefaction which is a region of high pressure

D a rarefaction which is a region of low pressure

7. March/2021/Paper_12/No.26

Which process causes a sound wave to produce an echo?

A diffraction

B dispersion

C reflection

D refraction

8. March/2021/Paper_12/No.27

A quiet sound is produced by a loudspeaker. The pitch of the sound remains constant but the loudness of the sound is increased.

Which property of the sound wave is increased?

A amplitude

B frequency

C speed

D wavelength

9. March/2021/Paper_22/No.20

What is the approximate wavelength in air of the highest frequency sound that can be heard by a normal healthy person?

A 0.02 m **B** 60 m **C** 20 000 m **D** 7 000 000 m

10. March/2021/Paper_22/No.26

The diagram represents a sound wave.

What are the names of the parts of the sound wave labelled X and Y?

	X	Y
A	amplitude	wavelength
B	compression	rarefaction
C	rarefaction	amplitude
D	wavelength	compression

11. March/2021/Paper_22/No.27

The speed of sound is different in different states of matter.

The speed of sound in liquid water is 1500 m / s.

Which row correctly compares the speed of sound in ice and the speed of sound in water vapour with the speed of sound in water?

	speed of sound in ice m / s	speed of sound in steam m / s
A	less than 1500	less than 1500
B	less than 1500	more than 1500
C	more than 1500	less than 1500
D	more than 1500	more than 1500

12. June/2021/Paper_31/No.8

(a) A loudspeaker is producing a sound.

Choose words from the box to complete the sentences about sound.

amplitude	frequency	speed	wavelength

(i) To increase the loudness of the sound, increase the ..... of the sound wave. [1]

(ii) To increase the pitch of the sound, increase the ..... of the sound wave. [1]

(b) Two students determine the speed of sound in air.
The students stand together, 80 m from a large brick wall as shown in Fig. 8.1.

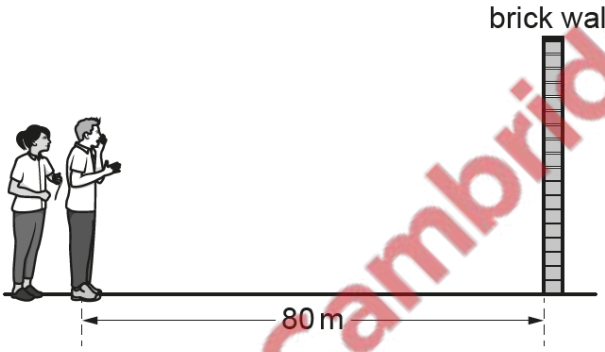


Fig. 8.1 (not to scale)

One student shouts and as he shouts the other student starts a stop-watch. She stops the stop-watch when she hears the echo of the shout.
The reading on the stop-watch is 0.56 s.

(i) State the **total** distance the sound travels during the 0.56 s.

distance = ... m [1]

(ii) Calculate the speed of sound in air using the measurements given in part **(b)**.

speed of sound = ... m/s [3]

(iii) The students' value for the speed of sound is **not** accurate.

Suggest **two** ways of improving the students' experiment.

1. .....

2. .....

[2]

[Total: 8]

13. June/2021/Paper_41/No.6

Fig. 6.1 is a full-scale diagram that represents a sound wave travelling in air.

Fig. 6.1

(a) On Fig. 6.1, mark **two** points, each at the centre of a different compression. Label both of the points C. [1]

(b) The speed of sound in air is 330 m / s.

Measure the diagram and determine the frequency of the sound.

frequency = ... [3]

(c) The wave reaches a barrier. Fig. 6.2 shows the wave passing through a gap in the barrier.

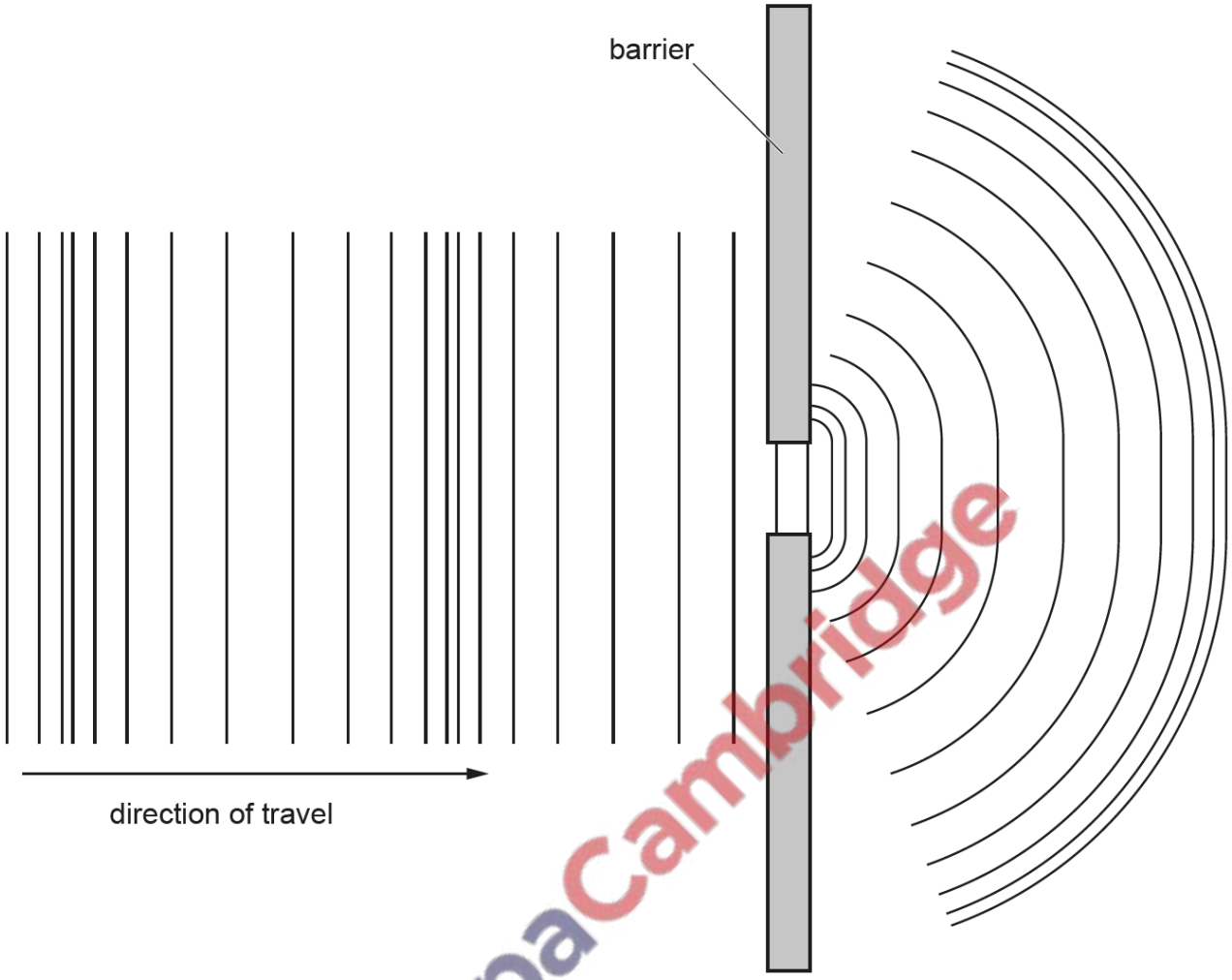


Fig. 6.2

The frequency of the wave is increased to a value many times greater than the value obtained in **(b)**.

Describe and explain **two** ways in which a diagram representing the wave with the greater frequency differs from Fig. 6.2.

1. .....

.....

2. .....

.....

[3]

[Total: 7]

14. March/2021/Paper_42/No.5

(a) State the name of the reflection of a sound wave or ultrasound wave.

..... [1]

(b) Fig. 5.1 shows an ultrasound wave being used to scan an internal organ of a human body.

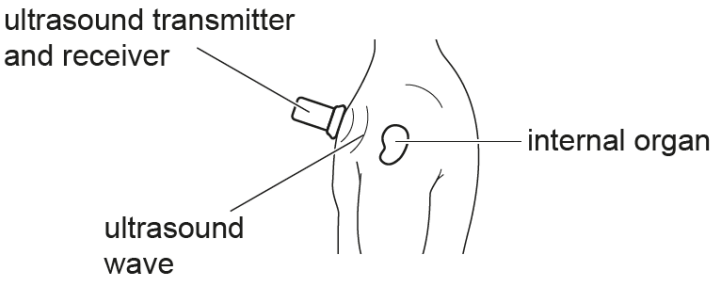


Fig. 5.1

The ultrasound wave has a frequency of 2.0 MHz and passes through human tissue at a speed of 1500 m/s.
Calculate the wavelength of the ultrasound wave in human tissue.

wavelength = ... [3]

(c) Fig. 5.2 shows crests of a wave from a point source S approaching a straight barrier.

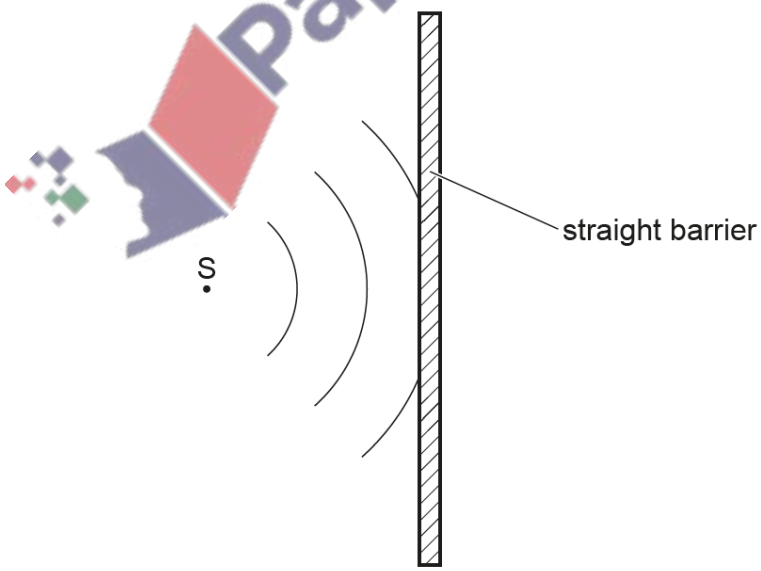


Fig. 5.2

(i) On Fig. 5.2, indicate and label **one** wavelength.

(ii) On Fig. 5.2, draw **three** crests of the wave reflected from the barrier.

[3]

[Total: 7]