

Ultrasound

Question Paper

Level	GCSE
Subject	Physics
Exam Board	AQA
Unit	P3
Topic	Ultrasound
Difficulty Level	Bronze Level
Booklet	Question Paper

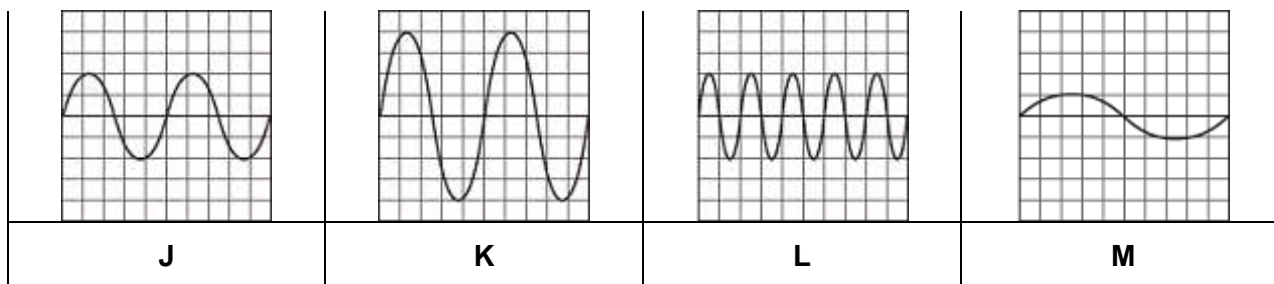
Time Allowed: 28 minutes

Score: /28

Percentage: /100

Q1.(a) The diagram shows four sound waves, **J**, **K**, **L** and **M**, represented on an oscilloscope screen.

They are all drawn to the same scale.



(i) Which **two** of the waves have the same amplitude?

Wave and wave

(1)

(ii) Which of the waves would sound the loudest?

Wave

(1)

(iii) Only **one** of the waves is an ultrasound wave.

Which **one** is the ultrasound wave?

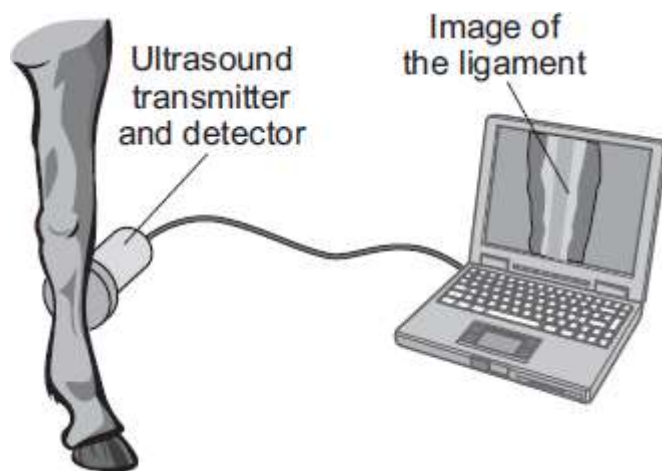
Wave

Give a reason for your answer.

.....

(2)

(b) The diagram shows ultrasound being used to examine the ligament inside the leg of a horse.



Use words from the box to complete the following sentences.

computer	detector	transmitter
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The sends pulses of ultrasound into the leg. When the ultrasound meets the ligament, some is reflected back to the

The reflected pulses are converted by a into an image that can be seen on the screen.

(2)
(Total 6 marks)

Q2. Ultrasound waves are very high frequency sound waves. They cannot be heard by humans.

(a) Ultrasound waves can be used to clean jewellery.

The jewellery is put into a container of cleaning fluid.



Complete each sentence to explain how ultrasound can clean jewellery.

The ultrasound generator makes the molecules of the cleaning fluid
 The molecules knock particles of
 from the surface of the jewellery.

(2)

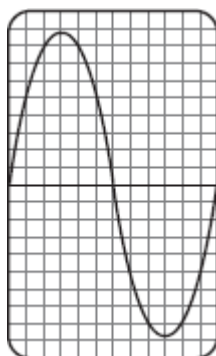
(b) Give a medical use for ultrasound.

.....

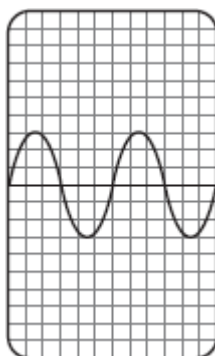
(1)

(c) Ultrasound waves can be represented on the screen of a cathode ray oscilloscope (CRO).

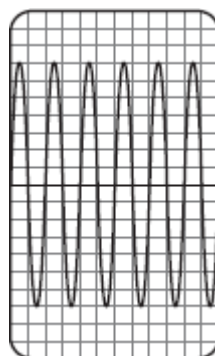
The diagrams show three ultrasound waves.
 Each wave is represented on an identical CRO screen, **A**, **B** and **C**.



Screen **A**



Screen **B**



Screen **C**

(i) How many complete waves are shown on screen **B**?

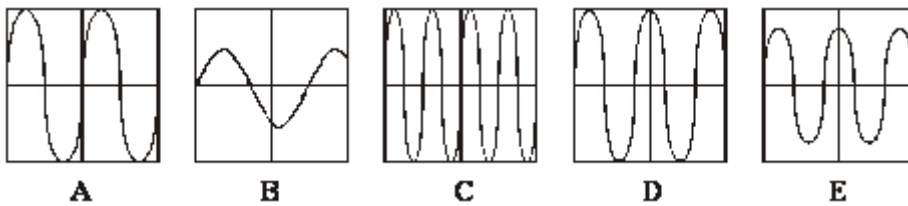
(1)

- (ii) Which screen shows the waves with the highest frequency?

Screen

(1)
(Total 5 marks)

- Q3.** (a) A student uses a microphone to send different sounds to an oscilloscope. The diagrams show five traces, **A**, **B**, **C**, **D** and **E**, on the oscilloscope. All the traces are drawn to the same scale.



- (i) Which **three** diagrams show traces with the same amplitude?

Diagrams , and

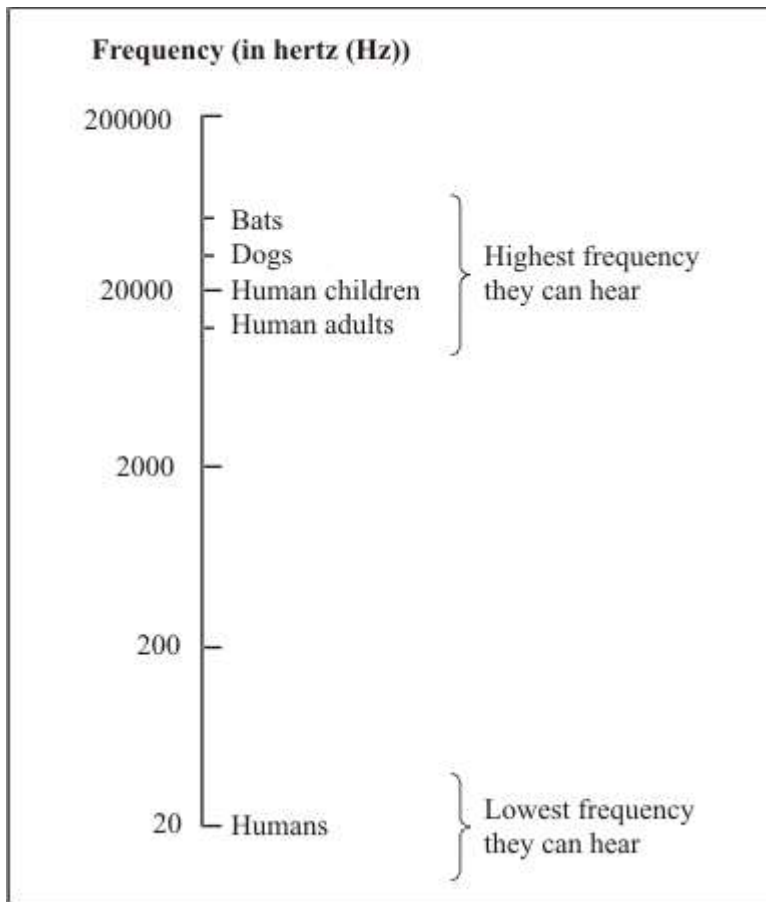
(1)

- (ii) Which **two** diagrams show traces with the same frequency?

Diagrams and

(1)

- (b) The diagram shows the sound frequencies which some living things can hear.



(i) What is the widest range of frequencies that a human child can hear?

.....

(1)

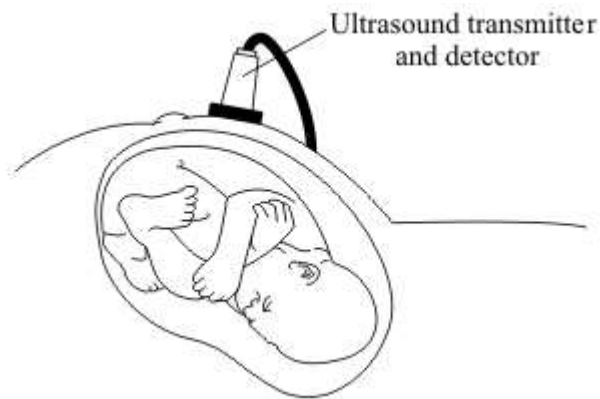
(ii) Why can some dog whistles be heard by dogs but not by humans?

.....

.....

(1)

(c) An ultrasound scan can be used to make a picture of a baby in its mother's womb. An ultrasound transmitter and detector are placed above the mother's womb. Ultrasound goes into the body of the mother and into the body of the baby.



Use the correct words from the box to complete the sentences.

detector	reflection	refraction	sound	substance	transmitter
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- (i) When the ultrasound crosses from one to another, some ultrasound becomes an echo caused by

- (ii) This information is collected by the ultrasound and made into a picture on a screen.

(3)
(Total 7 marks)

Q4. (a) Complete the following sentence:
Sound is produced when an object

(1)

(b) Choose words from the list to complete the following sentences:

higher louder lower quieter

- (i) If the frequency is increased, the pitch of the sound becomes
- (ii) If its amplitude is increased, the sound becomes

(2)

(c) The diagram shows a pre-natal scan.



- (i) What type of waves are used for pre-natal scanning?

.....

(1)

- (ii) Explain why we cannot hear these waves.

.....

(2)

(Total 6 marks)

Q5. The table gives the frequencies of sound that different animals can hear.

Animal	Lowest frequency it can hear in Hz	Highest frequency it can hear in Hz
Human	64	23 000

Dog	67	45 000
Mouse	1 000	91 000
Rat	200	76 000
Cat	45	64 000
Tuna	50	1 100
Canary	250	8 000
Chicken	125	2 000

(a) (i) Which animal can hear the lowest sound frequency?

.....

(1)

(ii) Which animal can hear the smallest range of frequencies?

.....

(1)

(b) (i) What is the name given to sound frequencies higher than those that humans can hear?

.....

(1)

(ii) Give **one** industrial use of this type of sound.

.....

(1)

(Total 4 marks)