Practice Question Set For GCSE
Subject : Physics
Paper-1 Topic : Waves

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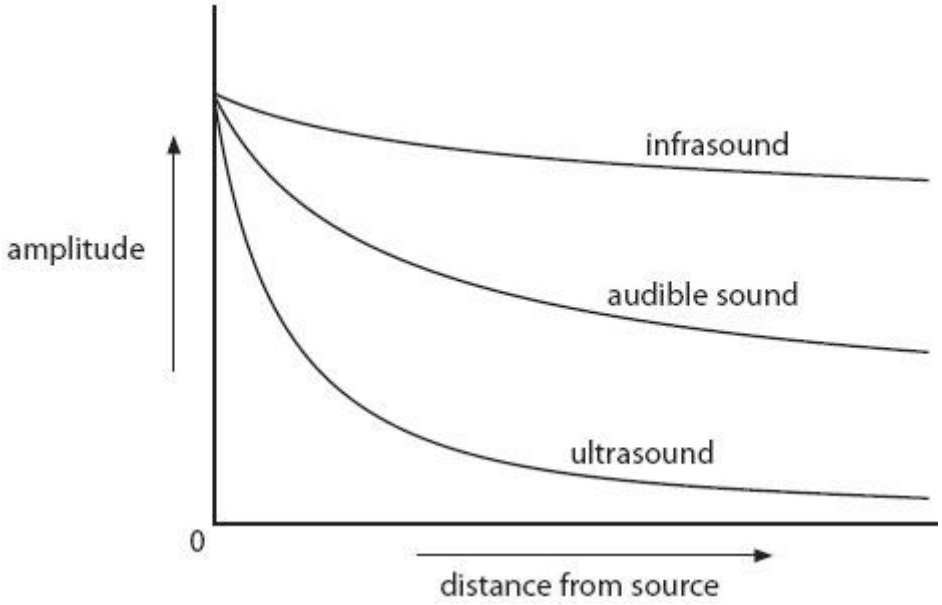
Name of the Student:_____
Max. Marks : 22 Marks **Time : 22 Minutes**

Q1.

As a sound wave travels through water its amplitude gets smaller.
This graph shows how the amplitude of different types of sound waves decreases as they travel through water.



Whales use sound to communicate over long distances.
Explain which is the best type of sound wave for whales to use when communicating over long distances.

(2)

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Q2.

Four students and their teacher do an experiment to measure the speed of sound in air.

The teacher stands at a distance and fires a starting pistol into the air.
The students see the flash when the pistol is fired.
They measure the time from when they see the flash to when they hear the bang.

A student drew a diagram of the arrangement as shown in Figure 7.

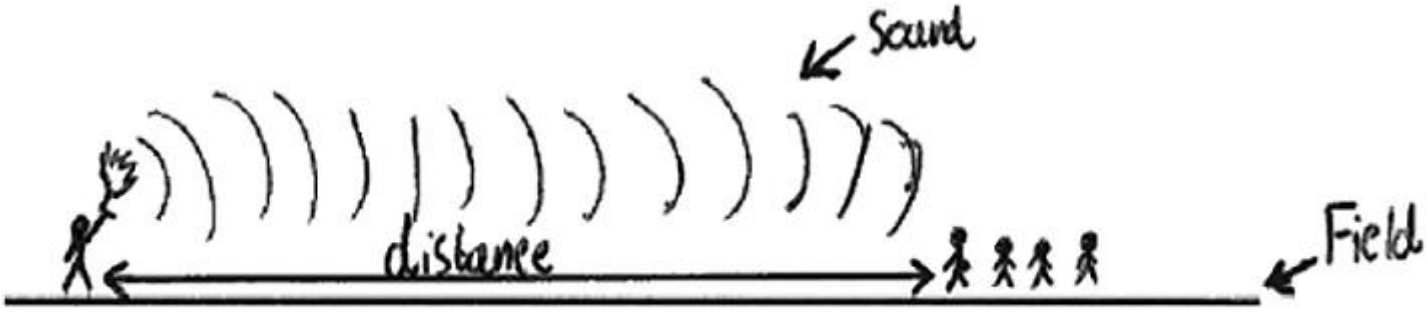

Figure 7

The students obtained a value of 240 m/s for the speed of sound.

The accepted value, in a science data book, is 343 m/s.

(i) Calculate the difference between the students' value and the accepted value as a percentage of the accepted value.

(2)

percentage difference = ... %

(ii) When the distance was 100 m, the students measured the following times:

0.43 s 0.35 s 0.50 s 0.38 s

Explain why their times vary so much.

(2)

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(iii) Explain **one** way the students might improve this experiment.

(2)

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(Total for question = 6 marks)

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Q3.

Figure 14 shows the hearing responses of a human, a mouse and a bird over a range of frequencies of sound.

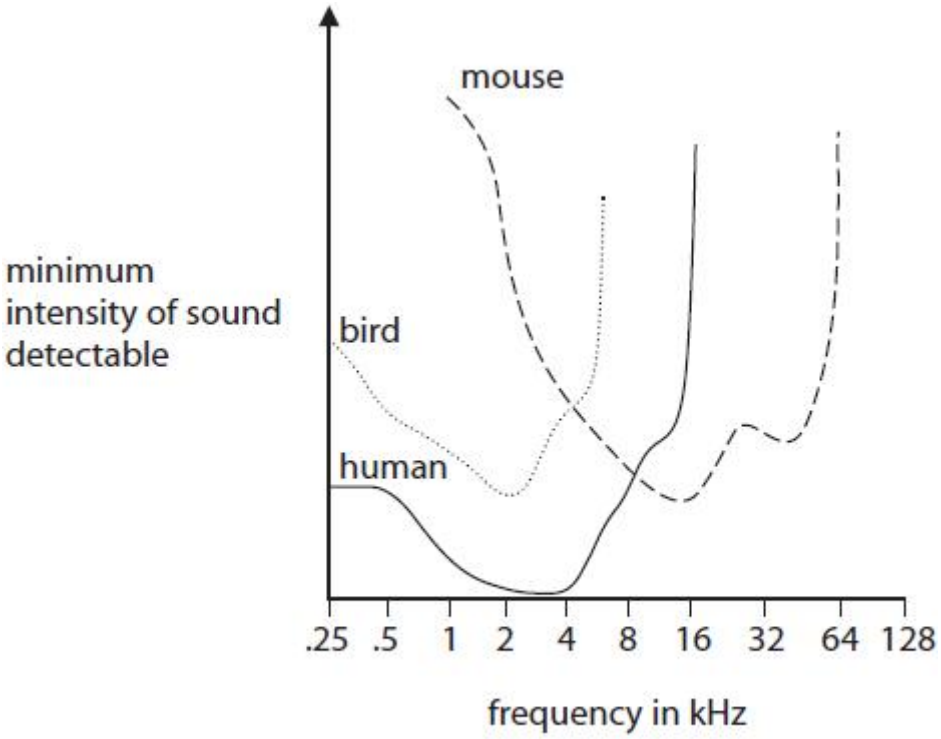

Figure 14

(i) Describe **two** differences between the hearing responses of the human and the mouse.

(2)

1 .....

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2 .....

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(ii) A farmer wants to use an alarm to scare away these birds.

State which frequency would be most effective.
Give the appropriate units.

(1)

frequency .....

(iii) State the reason for your choice of frequency in (ii).

(1)

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(Total for question = 4 marks)

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Q4.

Diagram 1 shows a glass prism which can be used to turn an image the right way up.

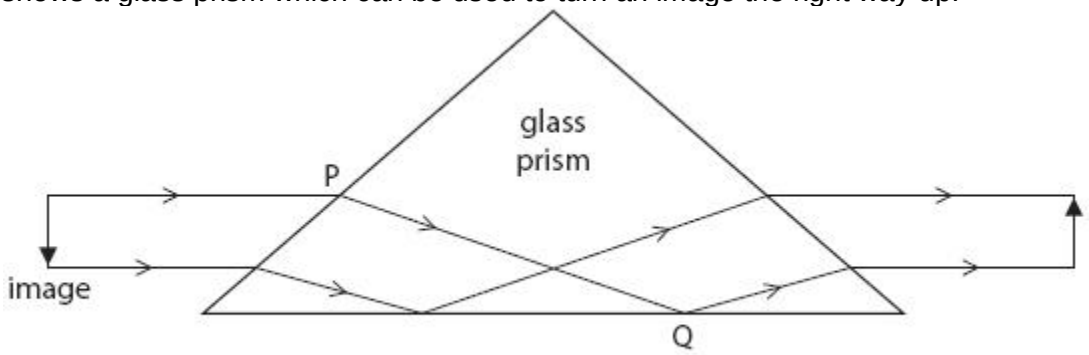

Diagram 1

(a) (i) In diagram 1, total internal reflection occurs at Q.
Explain why total internal reflection occurs at Q.

(2)

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(ii) The way in which the light changes direction at P is shown in diagram 2.
Mark on the diagram (*i*) for the angle of incidence and (*r*) for the angle of refraction for the ray of light shown.

(2)

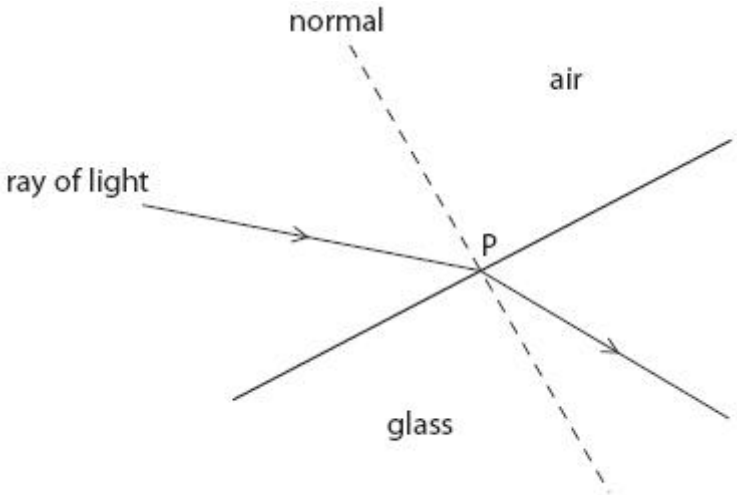

Diagram 2

(iii) Which of these is correct for the light as it enters the prism at P?
Put a cross (☒) in the box next to your answer.

(1)

☒ **A** frequency decreases

☒ **B** frequency increases

☒ **C** speed decreases

☒ **D** speed increases

(b) Light waves and sound waves are both used in the diagnosis and treatment of medical conditions
(i) A doctor uses an endoscope to look inside the body of a patient.
Explain how optical fibres are used in endoscopes.
You may draw a labelled diagram to help with your answer.

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(3)

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(ii) Describe how ultrasound can be used as a medical treatment for illness or injury.

(2)

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(Total for Question = 10 marks)

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