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

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**Name of the Student**:_____
**Max. Marks : 18 Marks** **Time : 18 Minutes**

Q1.

Figure 16 is an energy diagram for a sound wave incident on a sound-insulating board.

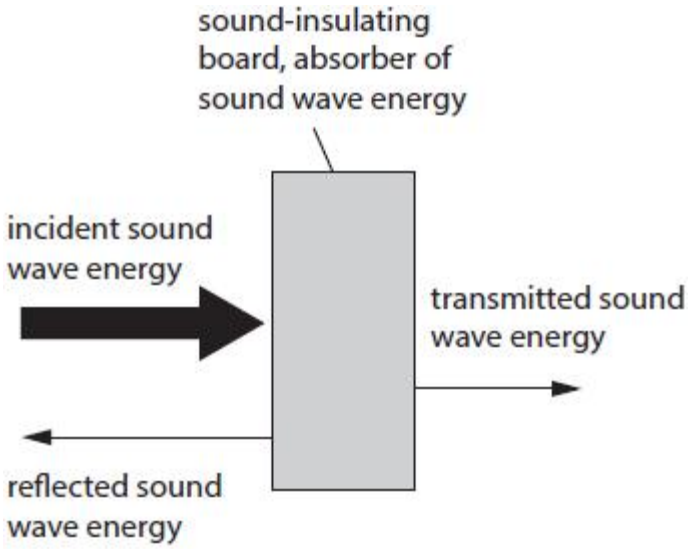



**Figure 16**

(i) The incident energy is 0.25 J.

The absorbed energy is 67% of the incident energy.
The reflected energy is 15% of the incident energy.
Calculate the amount of the transmitted energy.

**(2)**

transmitted energy = ..... J

(ii) Give **one** way to reduce the percentage of energy transmitted through the sound-insulating board.

**(1)**

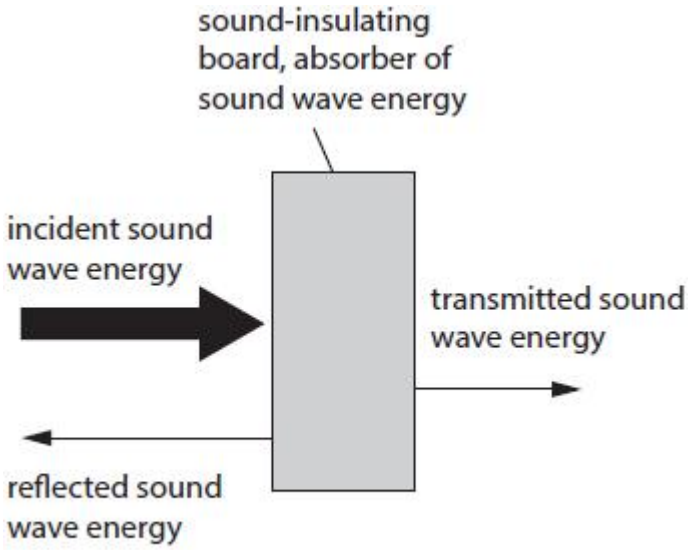
.....

.....

**(Total for question = 3 marks)**

Q2.

Figure 16 is an energy diagram for a sound wave incident on a sound-insulating board.

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.....

.....

**(Total for question = 3 marks)**

Q3.

**Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.**

Figure 9 shows two technicians, L and M, measuring the speed of sound in air.

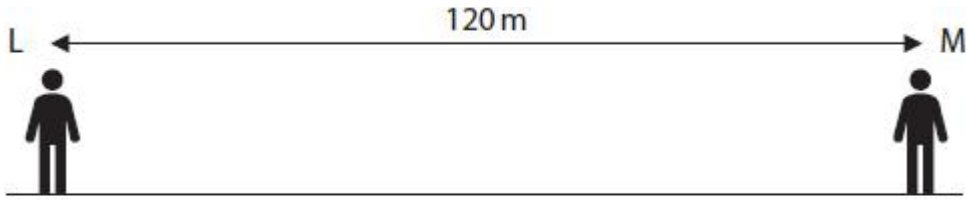


**Figure 9**

L fires a starting pistol.

M starts a stopwatch when first seeing the smoke from the starting pistol.

M stops the stopwatch when hearing the bang made by the starting pistol.

The distance between L and M is 120 m.

M's reaction time is 0.23 s.

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

(i) Calculate M's reaction time as a percentage of the time sound takes to travel from L to M.

**(3)**

..... %

(ii) Which of these would improve the technicians' measurement of the speed of sound?

**(1)**

- ☒ **A** Use a firework 'banger' instead of the starting pistol.
- ☒ **B** Use a stop clock that measures time in minutes.
- ☒ **C** Increase the distance between **L** and **M**.
- ☒ **D** Decrease the distance between **L** and **M**.

**(Total for question = 4 marks)**

Q4.

A transducer can transmit and detect ultrasonic waves.

Figure 15 shows ultrasonic waves transmitted by the transducer on the bottom of a ship.

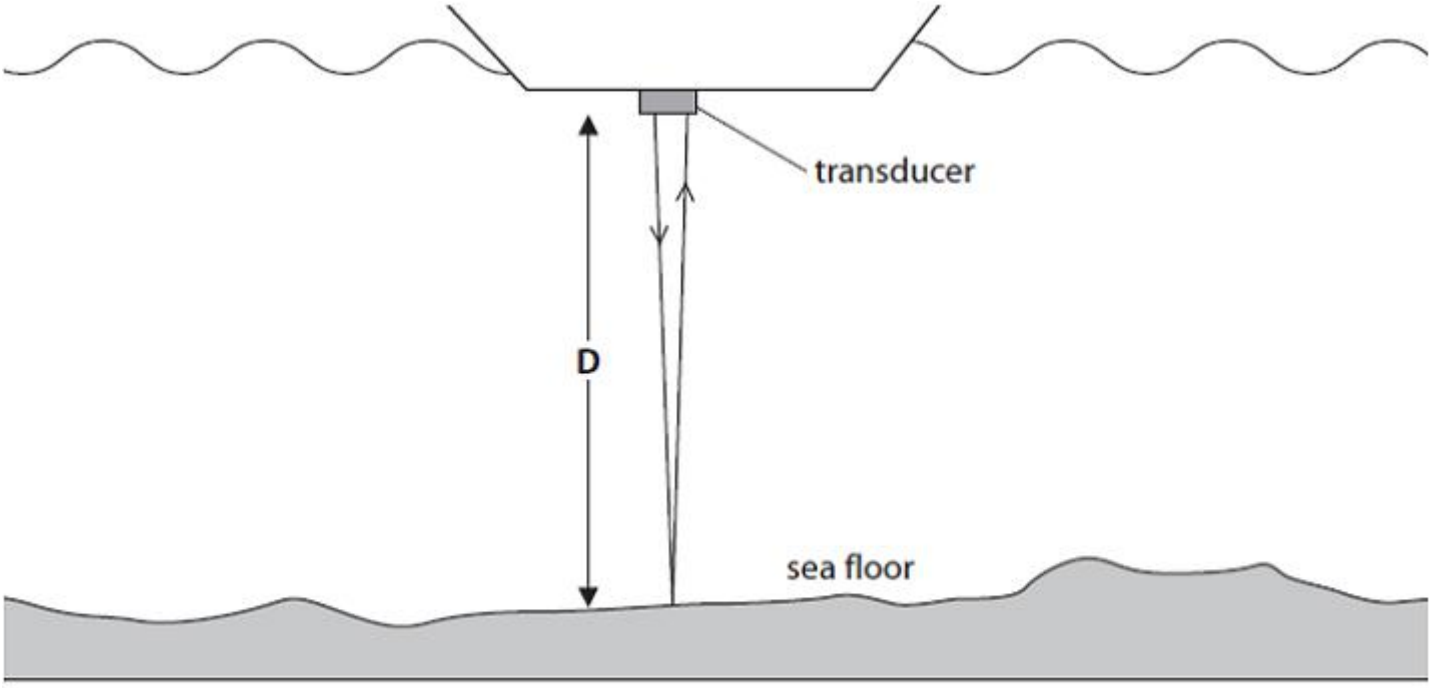


**Figure 15**

The waves reflect off the sea floor and are received back at the transducer.

The waves travel at 1500 m / s.

The time between transmission and reception is 48 milliseconds.

Calculate the depth of water, D, shown in Figure 15.

**(2)**

depth of water, D = ..... m

**(Total for question = 2 marks)**

Q3.

The pulse returns to the bat after a time of 18 ms.

Calculate the distance from the bat to its prey.

**(4)**

distance = ..... m

**(Total for question = 4 marks)**

Q4.

Figure 1 shows a bat and its prey.


**Figure 1**

The bat emits a high frequency sound pulse to locate its prey.

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

The wavelength of the sound is 11 mm.

Calculate the frequency of the sound.

**(2)**

Use the equation

$$v = f \times \lambda$$

frequency = ..... Hz

**(Total for question = 2 marks)**