**Q1.**

The diagram shows a wave.



(a)     Which arrow shows the amplitude of the wave?

Tick **one** box.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A** |  | **B** |  | **C** |  | **D** |  |

**(1)**

(b)     Which arrow shows the wavelength of the wave?

Tick **one** box.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A** |  | **B** |  | **C** |  | **D** |  |

**(1)**

(c)     It takes 0.5 seconds for a wave in the diagram to travel from point **P** to point **Q**.

Calculate the frequency of the waves shown in the diagram.

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Frequency = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Hz **(2)**

(d)     What type of wave is sound?

Tick **one** box.

|  |  |
| --- | --- |
| Electromagnetic |  |
| Longitudinal |  |
| Transverse |  |

**(1)**

Two students carried out an experiment to determine the speed of sound.

This is the method used.

1.     Student A stands 100 m away from Student B.

2.     Student A bangs two blocks of wood together making a loud sound.

3.     Student B starts a stopclock when he sees the blocks of wood bang together.

4.     Student B stops the stopclock when he hears the sound and records the time.

5.     The students repeat steps 2‒4 several times.

The students calculated the speed of sound from their results.

(e)     Suggest the most likely source of error in the experiment.

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**(1)**

(f)      The speed of sound calculated was lower than the true speed of sound in air.

Suggest **one** improvement to the students’ method that would give a more accurate value for the speed of sound.

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**(1)**

(g)     A student compares the properties of visible light waves and radio waves.

Which **two** properties are the same for both visible light waves **and** radio waves?

Tick **two** boxes.

|  |  |
| --- | --- |
| Both are transverse waves |  |
| Both can travel through a vacuum |  |
| Both have the same amplitude |  |
| Both have the same frequency |  |
| Both have the same wavelength |  |

**(2)**

**(Total 9 marks)**

**Q2.**

Waves may be longitudinal or transverse.

(a)     Describe the differences between longitudinal waves and transverse waves.

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**(3)**

(b)     Radio waves are electromagnetic waves.

Describe how radio waves are different from sound waves.

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**(4)**

**(Total 7 marks)**