**Q1.**

(a)    **Diagram 1** shows two waves.

**Diagram 1**

****

(i)      Name **one** wave quantity that is the same for the two waves.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **(1)**

(ii)     Name **one** wave quantity that is different for the two waves.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **(1)**

(iii)    The waves in **Diagram 1** are transverse.

Which **one** of the following types of wave is **not** a transverse wave?

Draw a ring around the correct answer.

|  |  |  |
| --- | --- | --- |
| **gamma rays** | **sound** | **visible light** |

**(1)**

(b)     **Diagram 2** shows water waves in a ripple tank moving towards and passing through a gap in a barrier.

**Diagram 2**

****

Every second, 8 waves pass through the gap in the barrier. The waves have a wavelength of 0.015 metres.

Calculate the speed of the water waves and give the unit.

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Speed = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**(3)**

**(Total 6 marks)**

**Q2.**

(a)     Write down the equation that links frequency, wave speed and wavelength.

Equation \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **(1)**

(b)     The signals for the monitor unit are transmitted as electromagnetic waves with a wavelength of 0.125 m.

Wave speed of electromagnetic waves = 3 × 108 m / s

Calculate the frequency of the signal.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Frequency = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Hz **(3)**

**(Total 4 marks)**

**Q3.**

A sound wave is an example of a longitudinal wave.

(a)     **Figure 1** shows the air particles in a sound wave as the wave travels from a loudspeaker to an ear.



Write a letter **R** on **Figure 1** to show an area of rarefaction.

**(1)**

(b)     Complete the sentence about longitudinal waves.

The vibrations of the air particles are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to the direction of energy transfer.

**(1)**

(c)     A stationary car horn emits a sound wave of frequency 400 Hz.

The wavelength of the wave is 0.85 m.

Calculate the speed of sound.

Use the correct equation from the Physics Equations Sheet.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Speed of sound = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ m / s

**(2)**

**(Total 4 marks)**