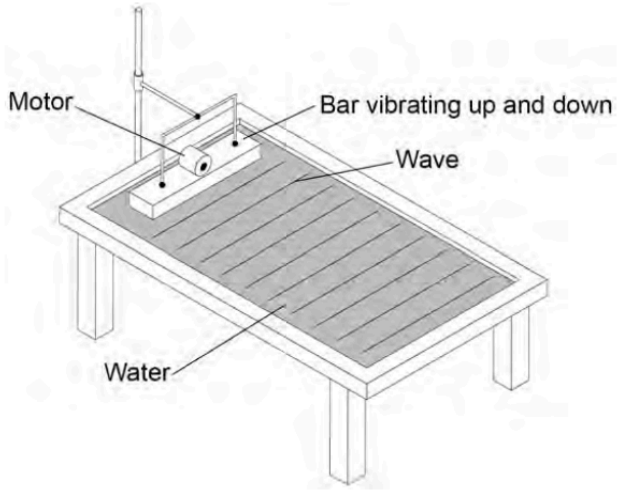
Q1.(2018)

Figure 2 shows a ripple tank that a student used to investigate water waves.

Figure 2



The student adjusted the speed of the motor so that the bar hit the water more times each second.

What happened to the frequency of the waves produced?

Tick **one** box.

[1 mark]

Decreased ☐

Did not change ☐

Increased ☐

b)

Describe how the frequency of the water waves in the ripple tank can be measured.

[2 marks]

_____

_____

_____

_____

c)

The student measured the frequency of the water waves as 5 hertz.

Calculate the period of the water waves.

Use the equation:

$$\text{period} = \frac{1}{\text{frequency}}$$

Choose the unit.

metres	**metres / second**	**seconds**

[3 marks]

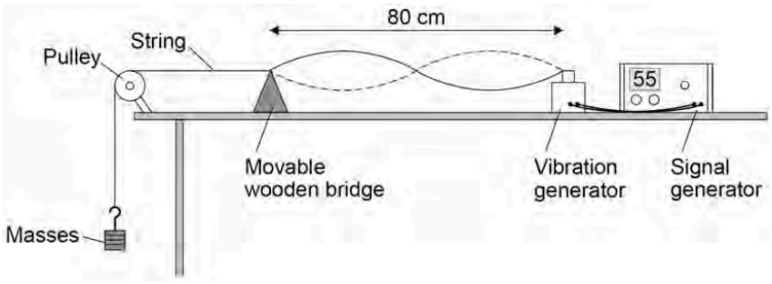
Period = _____ Unit _____

Q2.(2019)

a)

Figure 23 shows the apparatus used to investigate the waves in a stretched string.

Figure 23



The frequency of the signal generator is adjusted so that the wave shown in **Figure 23** is seen.

At this frequency the string vibrates between the two positions shown in **Figure 23**.

The wavelength of the wave shown in **Figure 23** was measured as 80 cm

What piece of apparatus would have been suitable for measuring this wavelength?

[1 mark]

b)

Write down the equation which links frequency, wavelength and wave speed.

[1 mark]

c)

The string in **Figure 23** vibrates at 55 Hz

Calculate the wave speed of the wave shown in **Figure 23**.

Use data given in **Figure 23**.

[3 marks]

Wave speed = _____ m/s

d)

The frequency of the signal generator is increased.

This makes the wavelength of the wave change.

The wave speed stays the same.

Describe how the apparatus could be adjusted to show one complete wave without reducing the frequency.

[2 marks]

e)

A student wants to investigate how the speed of a wave on a stretched string depends on the tension in the string.

The student uses the apparatus in **Figure 23**.

Describe a method the student could use for this investigation.

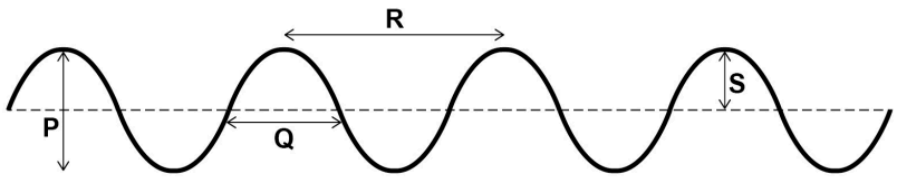
[4 marks]

Q3.(2020)

a)

Figure 2 shows some waves.

Figure 2



Which arrow represents the wavelength of the waves?

[1 mark]

Tick (✓) **one** box.

P ☐

Q ☐

R ☐

S ☐

b)

Which arrow represents the amplitude of the waves?

[1 mark]

Tick (✓) **one** box.

P ☐

Q ☐

R ☐

S ☐

c)

The waves have a frequency of 0.20 hertz.

Calculate the period of the waves.

Use the equation:

$$\text{period} = \frac{1}{\text{frequency}}$$

[2 marks]

Period = _____ s

d)

The frequency of the waves is increased. The speed of the waves stays the same.

What happens to the wavelength of the waves?

[1 mark]

Tick (✓) **one** box.

The wavelength decreases. ☐

The wavelength increases. ☐

The wavelength stays the same. ☐

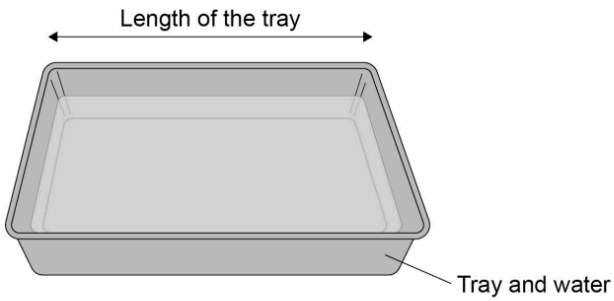
Q4.(2020)

a)

A student investigated how the speed of water waves is affected by the depth of water in a tray.

Figure 3 shows some water in a rectangular tray.

Figure 3



The student lifted one end of the tray and then dropped it.

This made a wave which travelled the length of the tray.

The student measured the length of the tray.

What else should the student measure in order to calculate the speed of the wave?

[1 mark]

Tick (✓) **one** box.

- Area of the bottom of the tray ☐
- Depth of water in the tray ☐
- Temperature of the water in the tray ☐
- Time taken by the wave to travel the length of the tray ☐

b)

What was the independent variable in this investigation?

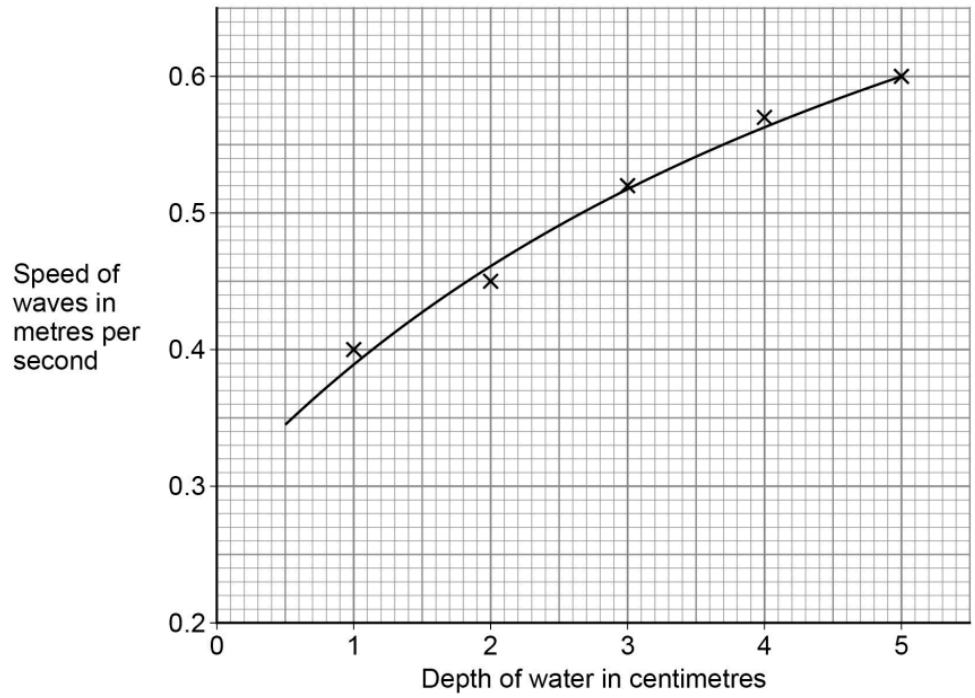
[1 mark]

- Depth of water ☐
- Length of tray ☐
- Speed of waves ☐

c)

Figure 4 shows the results.

Figure 4



Give **one** conclusion that can be made from **Figure 4**.

[1 mark]

_____

_____

d)

What was the speed of a wave when the depth of water was 2.5 cm?

[1 mark]

Speed of wave = _____ m/s

Q5.(2021)

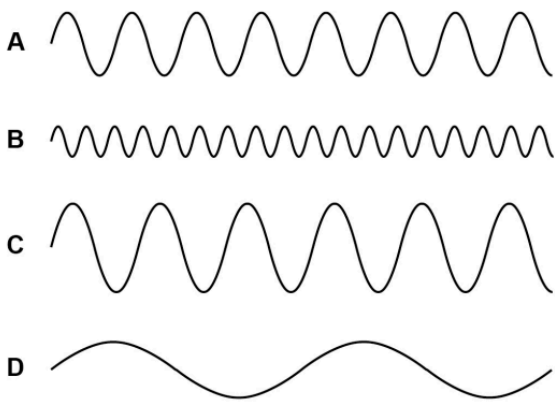
a)

Figure 2 shows four water waves.

The waves are all drawn to the same scale.

The waves all travel at the same speed.

Figure 2



Which wave has the longest wavelength?

[1 mark]

Tick (✓) **one** box.

A ☐ **B** ☐ **C** ☐ **D** ☐

b)

Which wave has the highest frequency?

[1 mark]

Tick (✓) **one** box.

A ☐ **B** ☐ **C** ☐ **D** ☐

Q6.(2022)

a)

Sound travels as longitudinal waves.

Complete the sentences.

Choose the answers from the box.

[2 marks]

amplitude	**frequency**	**speed**	**wavelength**

The distance between the centre of one compression of a sound wave and the centre of the next compression is called the _____ .

The number of waves passing a point each second is called the _____ .

b)

Complete the sentence.

Choose the answer from the box.

[1 mark]

opposite	**perpendicular**	**parallel**

In a longitudinal wave, the oscillations are _____ to the direction of energy transfer.

Q7.(2022)

a)

A sound wave has a frequency of 8.0 kHz.

Which of the following is the same as 8.0 kHz?

[1 mark]

Tick (✓) **one** box.

- 0.0080 Hz ☐
- 8.0 Hz ☐
- 8000 Hz ☐
- 800 000 Hz ☐

b)

Calculate the period of a sound wave with a frequency of 8.0 kHz.

Use the Physics Equations Sheet.

[2 marks]

Period = _____ s

Q8.(2022)

Calculate the wavelength of a sound wave with a frequency of 6600 Hz.

speed of sound = 330 m/s

Use the equation:

$$\text{wavelength} = \frac{\text{speed}}{\text{frequency}}$$

Choose the unit from the box.

[3 marks]

kg	**m**	**N**

Wavelength = _____ Unit _____

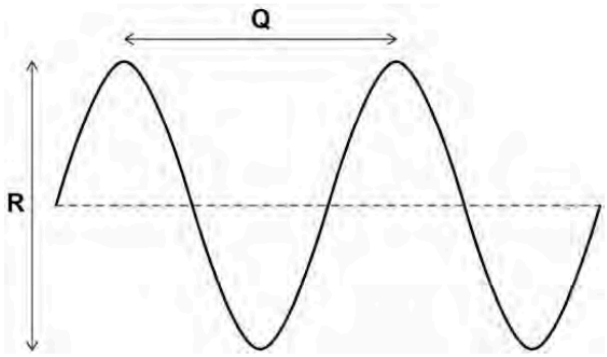
Q9.(2023)

a)

Electromagnetic waves are transverse.

Figure 13 represents a transverse wave.

Figure 13



Which of the following gives the wavelength of the transverse wave?

[1 mark]

Tick (✓) **one** box.

wavelength = $\frac{Q}{2}$ ☐

wavelength = Q ☐

wavelength = 2 Q ☐

b)

Which of the following gives the amplitude of the transverse wave?

[1 mark]

Tick (✓) **one** box.

amplitude = $\frac{R}{2}$ ☐

amplitude = R ☐

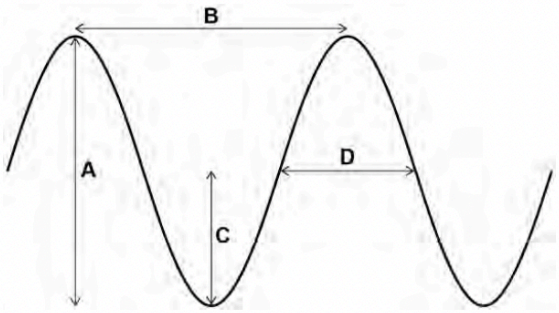
amplitude = 2 R ☐

Q10.(2024)

a)

Figure 7 represents a transverse wave.

Figure 7



Which arrow represents the amplitude of the wave?

[1 mark]

Tick (✓) **one** box.

A ☐ **B** ☐ **C** ☐ **D** ☐

b)

Which arrow represents the wavelength of the wave?

[1 mark]

Tick (✓) **one** box.

A ☐ **B** ☐ **C** ☐ **D** ☐

c)

A wave has a frequency of 5000 Hz.

Calculate the period of the wave.

Use the equation:

$$\text{period} = \frac{1}{\text{frequency}}$$

[2 marks]

Period = _____ s

Q11.(2024)

a)

A sound wave has a frequency of 750 Hz.

speed of sound in air = 330 m/s

Calculate the wavelength of the sound wave.

Use the equation:

$$\text{wavelength} = \frac{\text{wave speed}}{\text{frequency}}$$

[2 marks]

Wavelength = _____ m

b)

Describe a method that could be used to determine the speed of sound in air.

[4 marks]

c)

When a sound wave moves from air into water, the speed of the wave increases.

The frequency of the sound wave does **not** change.

Complete the sentence.

Choose the answer from the box.

[1 mark]

decreases	**stays the same**	**increases**

When a sound wave moves from air into water its

wavelength _____.