AQA - Waves – GCSE Combined Science Physics

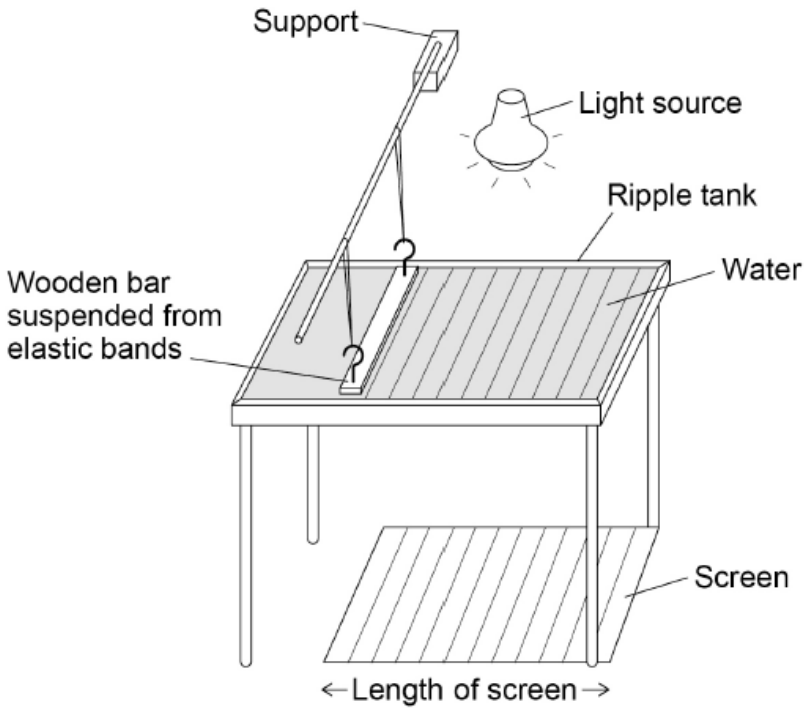
1. June/2021/Paper_2F/No.4

0 4 **Figure 7** shows a ripple tank.

The wooden bar vibrates up and down producing waves on the water.

The light source produces shadows of the water waves on the screen.

Figure 7



0 4 . 1 Describe how the student can measure the frequency and wavelength of the waves.

You should refer to any equipment the student needs in your answer.

[4 marks]

A student measured the frequency and wavelength of the waves produced.

Table 1 shows some of the results.

Table 1

Reading	**1**	**2**	**3**	**Mean**
Frequency in hertz	12.8	12.4	12.3	**X**

0 4 . 2 Calculate value **X** in **Table 1**.

[1 mark]

X = _____ Hz

0 4 . 3 Why is it a good idea to take repeat readings and then calculate a mean?

[1 mark]

Tick (✓) **one** box.

To reduce the effect of random errors. ☐

To reduce the effect of systematic errors. ☐

To reduce the effect of zero errors. ☐

0 4 . 4 The student changed the frequency of the waves in the ripple tank to 20 Hz.

Calculate the period of the waves.

Use the equation:

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

[2 marks]

Period = _____ s

0 4 . 5 At a frequency of 20 Hz the wavelength of the waves was 0.012 m.

Calculate the wave speed.

Use the equation:

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

[2 marks]

Wave speed = _____ m/s

2. June/2021/Paper_2H/No.3

0 3 A student made water waves in a ripple tank.

0 3 . 1 Describe how the frequency and wavelength of the water waves in the ripple tank can be measured accurately.

[4 marks]

The student recorded values for the frequency and the wavelength of waves in the ripple tank.

Table 1 and **Table 2** show the results.

Table 1

Reading	**1**	**2**	**3**
Frequency in hertz	9.8	9.4	9.3

Table 2

Reading	**1**	**2**	**3**
Wavelength in cm	1.7	2.2	2.1

0 3 . 2 Determine the mean wave speed.

[4 marks]

Mean wave speed = _____ m/s

0 3 . 3 What is the advantage of taking repeat readings and then calculating a mean?

[1 mark]

0 3 . 4 The speed of the wave is affected by the depth of the water in the ripple tank.

The deeper the water the faster the wave.

Explain how the depth of the water affects the wavelength of the wave if the frequency is constant.

[2 marks]