

Name of the Student: _____

Max. Marks : 19 Marks

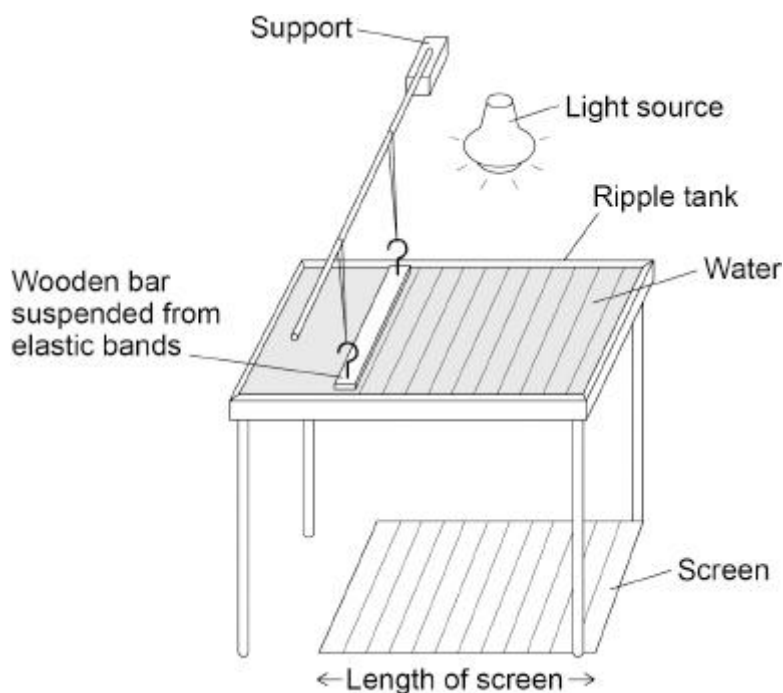
Time : 19 Minutes

Q1.

The figure below 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.



(a) 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.

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

The table below shows some of the results.

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

(b) Calculate value **X** in the table above.

$$X = \text{_____ Hz}$$

(1)

(c) Why is it a good idea to take repeat readings and then calculate a mean?

Tick (✓) **one** box.

To reduce the effect of random errors.

To reduce the effect of systematic errors.

To reduce the effect of zero errors.

(1)

(d) The student changed the frequency of the waves in the ripple tank to 20 Hz.

Calculate the period of the waves.

Use the equation:

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

$$\text{Period} = \text{_____ s}$$

(2)

(e) At a frequency of 20 Hz the wavelength of the waves was 0.012 m.

Calculate the wave speed.

Use the equation:

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

Wave speed = _____ m/s

(2)

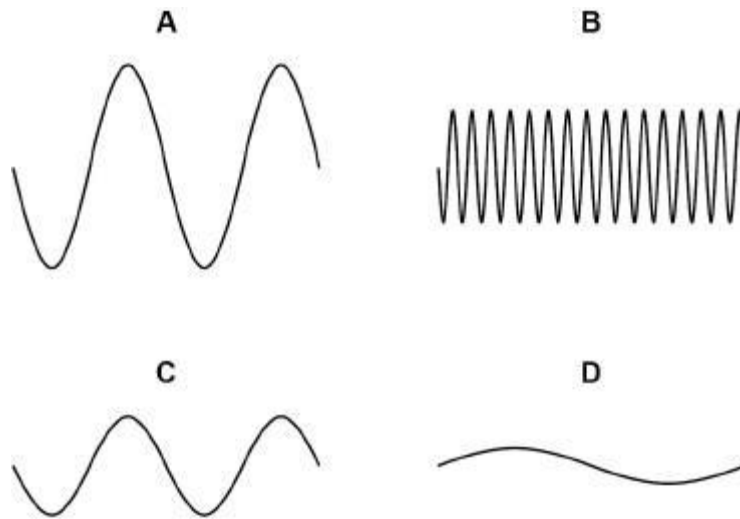
(Total 10 marks)

Q2.

Figure 1 shows four waves.

The waves are drawn to the same scale.

Figure 1



(a) Which wave has the greatest amplitude?

Tick (✓) **one** box.

A B C D

(1)

(b) Which wave has the greatest frequency?

Tick (✓) **one** box.

A B C D

(1)

(c) Which wave has the greatest wavelength?

Tick (✓) **one** box.

A B C D

(1)

(d) A wave has a frequency of 1650 Hz and a wavelength of 0.200 m
Calculate the wave speed.

Use the equation:

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

Wave speed = _____ m/s

(2)

A student uses a mobile phone app that displays sound waves.

Figure 2 shows the student holding the mobile phone close to a loudspeaker.

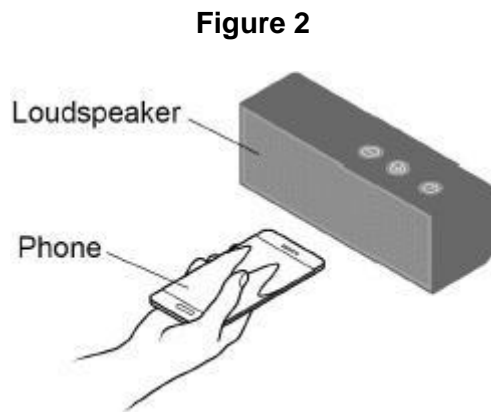
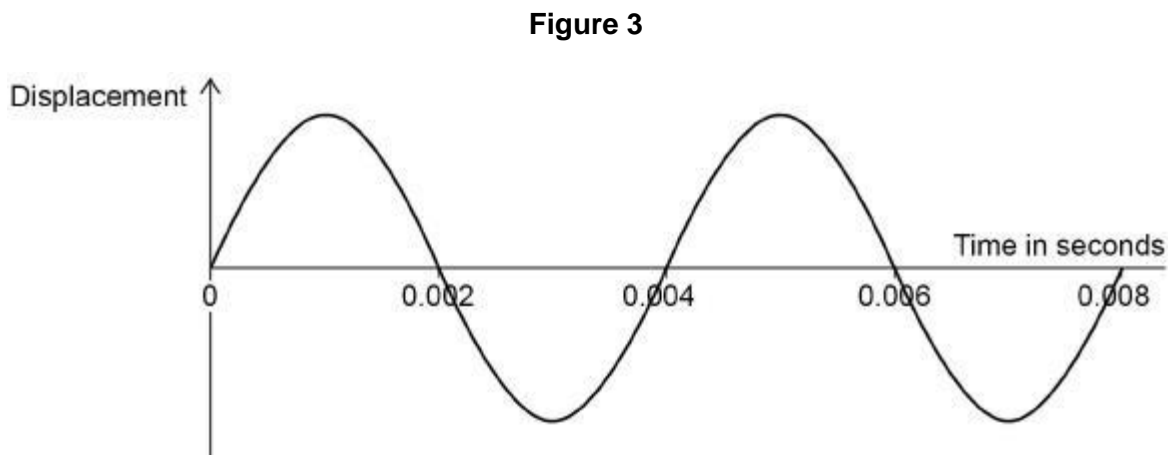


Figure 3 shows the wave pattern seen on the phone screen.



(e) What is the period of the wave shown in **Figure 3**?

Tick (✓) **one** box.

0.002 s

0.004 s

0.006 s

0.008 s

(1)

(f) Determine the frequency of the wave shown in **Figure 3**.

Use the Physics Equations Sheet.

Frequency = _____ Hz

(3)

(Total 9 marks)