Name: _____

Foundation Waves

Questions

Date:

Time:

Total marks available:

Total marks achieved: _____

Questions

Q1.

Light travels the 150 million km from the Sun to the Earth in about 500 s.
It takes about 2100 s for light to reach the Earth from Jupiter.
Using this information, calculate the approximate distance of Jupiter from the Earth.

(2)

distance of Jupiter from the Earth =.....million km

Q2.

A sound wave in air travels a distance of 220 m in a time of 0.70 s.

(i) State the equation linking speed, distance and time.

(1)

(ii) Calculate the speed of the sound wave in air.

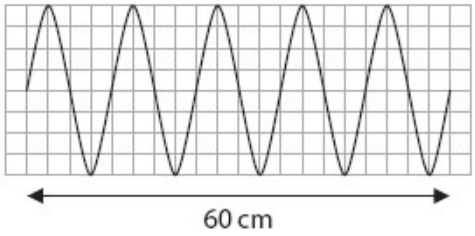
(2)

wave speed = ... m/s

(Total for question = 3 marks)

Q3.

Some students are investigating waves.
They produce waves by moving a piece of wood up and down in a tank of water.
The diagram shows the waves over a distance of 60 cm.



(i) State the number of wavelengths shown on the diagram.

(1)

number of wavelengths = ...

(ii) Calculate the wavelength of the waves.

(1)

wavelength of waves = ...cm

Q4.

The students produce a different wave.
This wave has a frequency of 1.7 Hz and a wavelength of 8.0 cm.

Calculate the speed of this wave.

(2)

speed of wave = ...cm/s

Q5.

A different water wave has a wavelength of 0.25 m and a frequency of 1.5 Hz.

Calculate the wave speed.

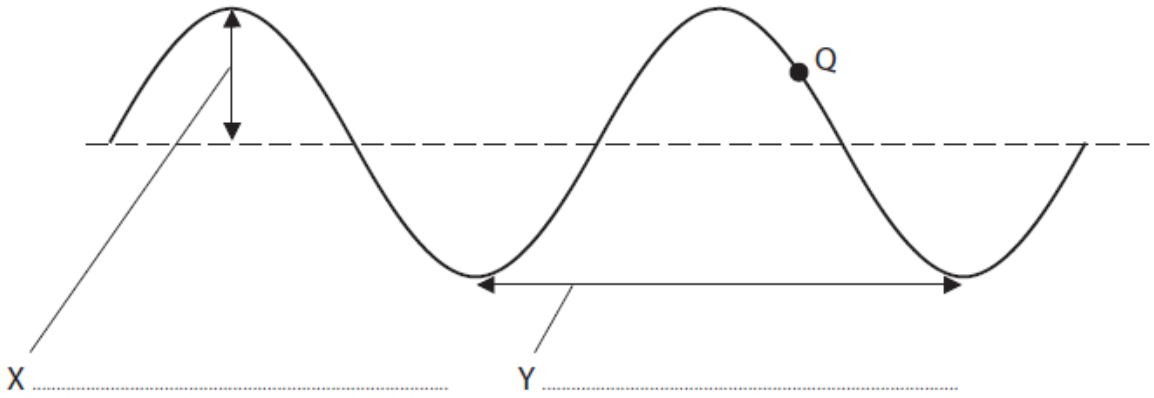
(2)

wave speed = ... m/s

(Total for question = 2 marks)

Q6.

The diagram shows a transverse wave.



(i) Use words from the box to label the distances X and Y.

amplitude	frequency	magnification	speed	wavelength

(2)

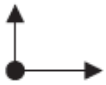
(ii) Q is a particle in the wave.

Which of these shows the way in which particle Q moves?

Put a cross (☒) in the box next to your answer.

(1)

☒ A 

☒ B 

☒ C

☒ D 

Q7.

A wave has a frequency of 15 Hz.
Its wavelength is 125 m.

Calculate the speed of the wave.

State the unit.

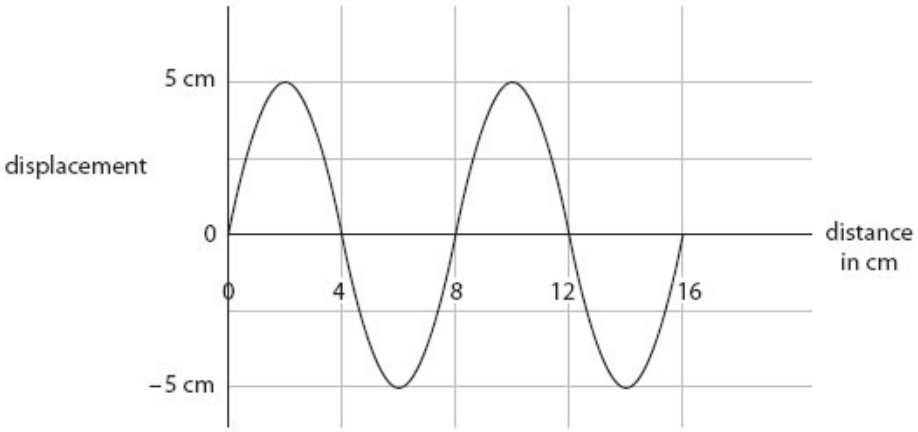
(3)

speed of wave = ...

unit = ...

Q8.

(i) The diagram represents a wave.



State the amplitude and wavelength of the wave.

(2)

amplitude of the wave = ... cm

wavelength of the wave = ... cm

(ii) 20 waves are sent out in 4 seconds.

Complete the sentence by putting a cross (☒) in the box next to your answer.

The frequency of the wave is

(1)

☒ **A** 0.2 Hz

☒ **B** 5 Hz

☒ **C** 20 Hz

☒ **D** 80 Hz

Q9.

Figure 4 is a diagram of a water wave.

A cork is floating on the water.

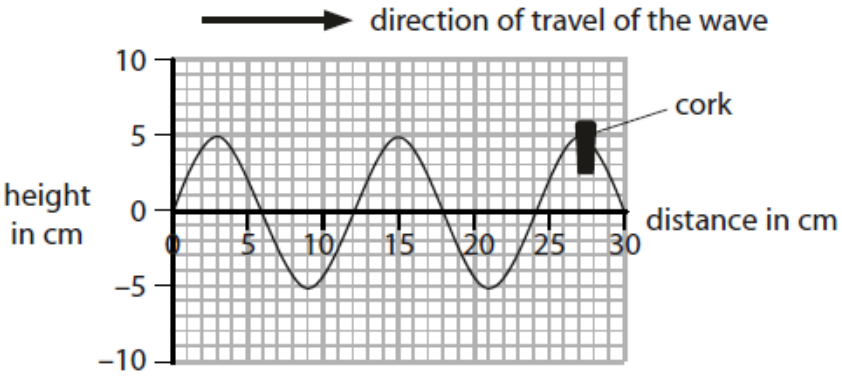


Figure 4

(i) Use the scale on the diagram to measure the wavelength of the wave.

(2)

wavelength = ... cm

(ii) Describe the motion of the cork.

You should include how the cork moves relative to the direction of travel of the wave.

(2)

.....

.....

.....

.....

(Total for question = 4 marks)

Q10.

The speed of light is 3.0×10^{8} m/s.

The wavelength of yellow light is 5.8×10^{-7} m.

Calculate the frequency of yellow light.

State the unit.

Use the equation

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

(3)

frequency = ... unit .....

(Total for question = 3 marks)

Q11.

(a) Seismic (earthquake) waves can be either P-waves or S-waves.

Which row of the table is correct for P-waves?

Put a cross (☒) in the box next to your answer.

(1)

	type of wave	can they be refracted?
☒ **A**	longitudinal	yes
☒ **B**	transverse	no
☒ **C**	longitudinal	no
☒ **D**	transverse	yes

(b) Explain why it is difficult to predict when an earthquake will happen.

(2)

.....

.....

.....

.....

Q12.

Sound waves are longitudinal waves.

Water waves are transverse waves.

Describe the difference between longitudinal waves and transverse waves.

(3)

.....

.....

.....

.....

.....

.....

(Total for question = 3 marks)

Q13.

Light and sound waves are produced at the same time by an explosion on Earth.

(i) The sound of the explosion is heard 1920 metres away 6.0 seconds after the explosion has happened.

Calculate the speed of sound in air.

(2)

speed of sound in air = ...m/s

(ii) A scientist is standing a long way from the explosion.

Explain why he hears the explosion a few seconds after he sees it.

(2)

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