

P6 Level Assessed Task 2

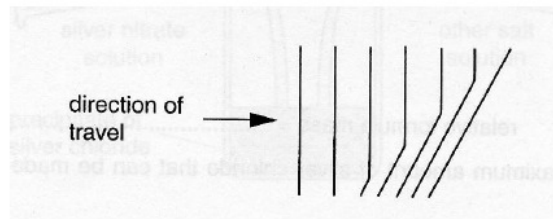
wave speed = frequency × wavelength

5. Sam carries out two experiments.

(a) She investigates waves in a ripple tank.

She sees that when the waves pass over a sheet of glass they change direction.

She draws this diagram to show the crests of the waves.



(i) What is this effect called?

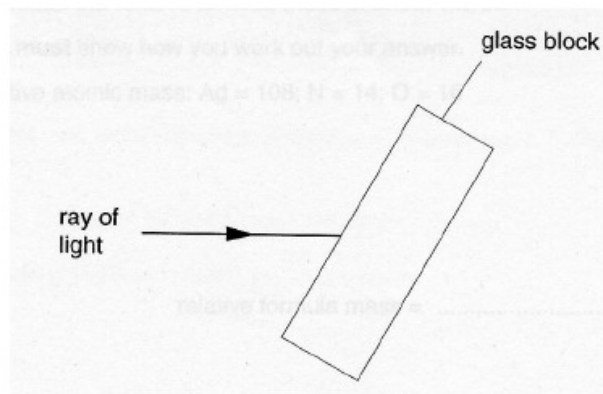
..... [1]

(ii) Draw on the diagram to show the edge of the sheet of glass.

[1]

(b) Sam then investigates what happens to a ray of light as it passes through a glass block.

She notices that the ray of light changes direction.



Complete the diagram to show the path of the ray as it passes through the glass block and back out into the air.

[2]

[Total: 4]

6. (a) The list shows types of electromagnetic waves and some uses of the waves and the reason the waves are suitable.

(i) Draw a straight line from each **type of wave** to the correct **use** and from the **use** to the reason.

type of wave	use of wave	reason
X-ray	cooking	absorbed by most solids
microwave	for making toast	absorbed by water molecules
infrared	detecting metal objects in luggage	absorbed by dense materials

(ii) All these waves travel at the same speed through space (a vacuum).

What is the speed?

..... [1]

(iii) Each type of electromagnetic wave carries energy.

Which of type of wave has photons with the most energy?

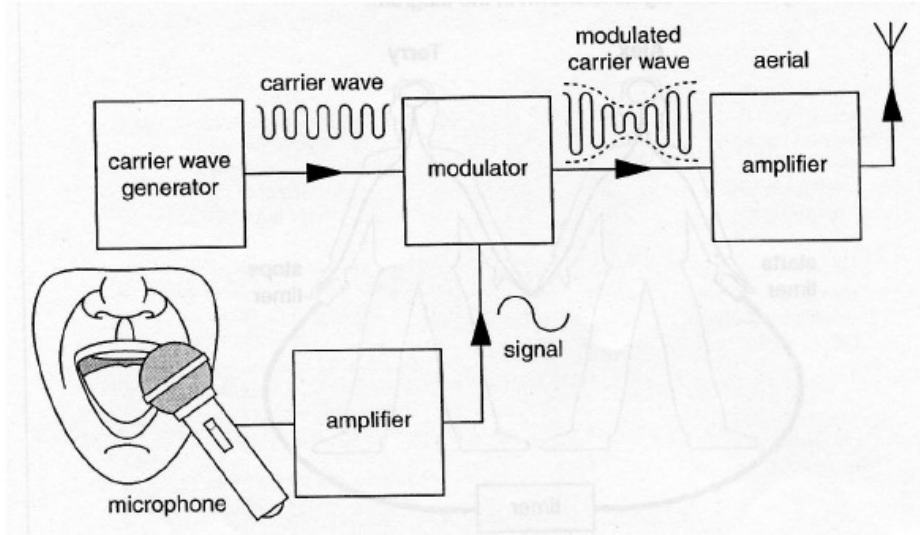
Put a ring around the correct answer.

infrared microwave radio visible light X-ray

[1]

(b) Radio waves are used to broadcast radio programmes.

The diagram shows the system used to create the radio signal.



(i) Which part of the system adds the sound signal to the carrier wave?

..... [1]

(ii) What type of signal is the modulated carrier wave shown in the diagram?

Put a ring around the correct answer.

- analogue digital frequency moulated longitudinal refracted

[1]

[Total: 6]

7. Saul made some notes on the transmission of digital signals.

- A Digital signals have two amplitudes, 'off' and 'on'.
- B As signals travel they get weaker.
- C Random additions to the original signal (noise) are picked up as the signal travels.
- D Signals cause electrical waves in a metal aerial.
- E Each time a signal is amplified, any noise that is picked up is also amplified.
- F The random noise signal is small compared to the amplitude of the 'on' signal.

(a) Which two statements **best** explain why signals deteriorate in quality?

Write down the letters of the statements.

..... [2]

(b) Which two statements **best** explain why digital signals are usually of better quality than analogue signals?

Write down the letters of the statements.

..... [2]

[Total: 4]

1 Jo uses a microwave oven to heat her dinner.



(a) These sentences are about the microwave oven.

Draw a straight line from the **start** of each sentence to its correct **end**.

start

The microwaves interfere ...

The microwaves are reflected ...

The microwaves are diffracted ...

The microwaves are absorbed ...

end

... by the water in the food.

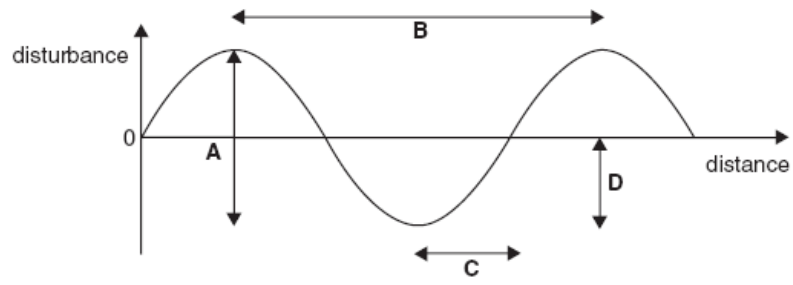
... when they pass through a gap.

... by the metal walls of the oven.

... where they overlap with each other.

[3]

(b) This graph shows a microwave.



Which distance, **A**, **B**, **C** or **D**, is the wavelength of the microwave?

answer [1]

[Total: 4]

2 Isobel uses a remote control to adjust her TV set.



(a) The remote control uses a beam of infrared to carry information to the TV set.

Finish the sentences by choosing the **best** words from this list.

- colour
- energy
- photons
- strength
- intensity
- momentum

The of the beam is the energy it delivers per second.

Its value depends on the number of put into the beam each second, as well as their

[2]

- (b) The infrared is modulated each time that Isobel presses a button on the remote control. The beam is pulsed on and off in a code, with a different code for each button.

Draw a straight line from the **start** of each sentence to its correct **end**.

start

end

Each pulse represents ...

... a 0 in the code.

... a 1 in the code.

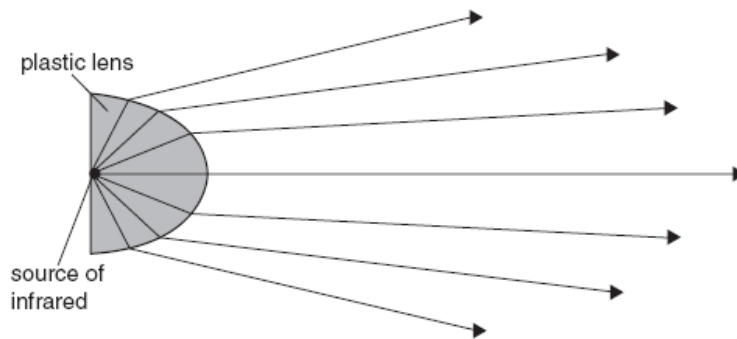
... information as a digital code.

The pulsed infrared beam transfers ...

... information as an analogue code.

[1]

(c) An LED is the source of the infrared in the remote control.



The LED is enclosed in a plastic lens.

(i) As the infrared leaves the plastic, most of it changes direction.

What is the name of this process?

Put a ring around the correct answer.

diffraction **reflection** **refraction** **rotation**

[1]

(ii) Which **one** of these statements explains the change of direction?

Put a tick (✓) in the box next to the correct answer.

The infrared spreads out as it leaves the lens.

The infrared rotates against the plastic as it reflects off the air.

The infrared speeds up as it moves from the plastic into the air.

The infrared slows down as it moves from the plastic into the air.

[1]

[Total: 5]

3 Jenny is a presenter for Radio CA.



(a) Jenny sings into the microphone.

- (i) The speed of sound waves in the studio is 340 m/s.
Jenny sings a note of frequency 680 Hz.
Which of these calculations gives the wavelength of her sound?

Put a **ring** around the correct answer.

$$\frac{680}{340}$$

$$680 \times 340$$

$$\frac{340}{680}$$

[1]

- (ii) Here are some statements about sound waves.
Some of these statements are true. Some are false.

Write **T** in the box next to each **true** statement and **F** in the box next to each **false** one.

The disturbance of a sound wave ...

... and its energy flow are in the same direction.

... increases in amplitude as the sound gets louder.

... is at right angles to the wave's direction of energy flow.

[1]

T (true)
or
F (false)

(b) Information in the sound wave modulates the radio wave from the transmitter.

(i) Which diagram represents frequency modulation of the radio wave?

Put a **ring** around the correct diagram.



[1]

(ii) Complete these sentences. Choose words from this list.

- regular**
- random**
- amplified**
- analogue**
- amplitude**
- modulated**
- wavelength**

The frequency modulated radio wave is an signal.

As it moves away from the transmitter its decreases.

The radio wave also picks up signals called noise.

This is still present when the signal is at the receiver.

[2]

[Total: 5]