

Name of the Student: \_\_\_\_\_

Max. Marks : 18 Marks

Time : 18 Minutes

**Q1.**

Electromagnetic waves can be diffracted, reflected and refracted.

Infrared, microwaves, radio waves and visible light can all be used for communication.

Draw **one** line from each part of the electromagnetic spectrum to its use.

Part	Use
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<input type="checkbox"/>	<input type="checkbox"/>
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<input type="checkbox"/>	<input type="checkbox"/>

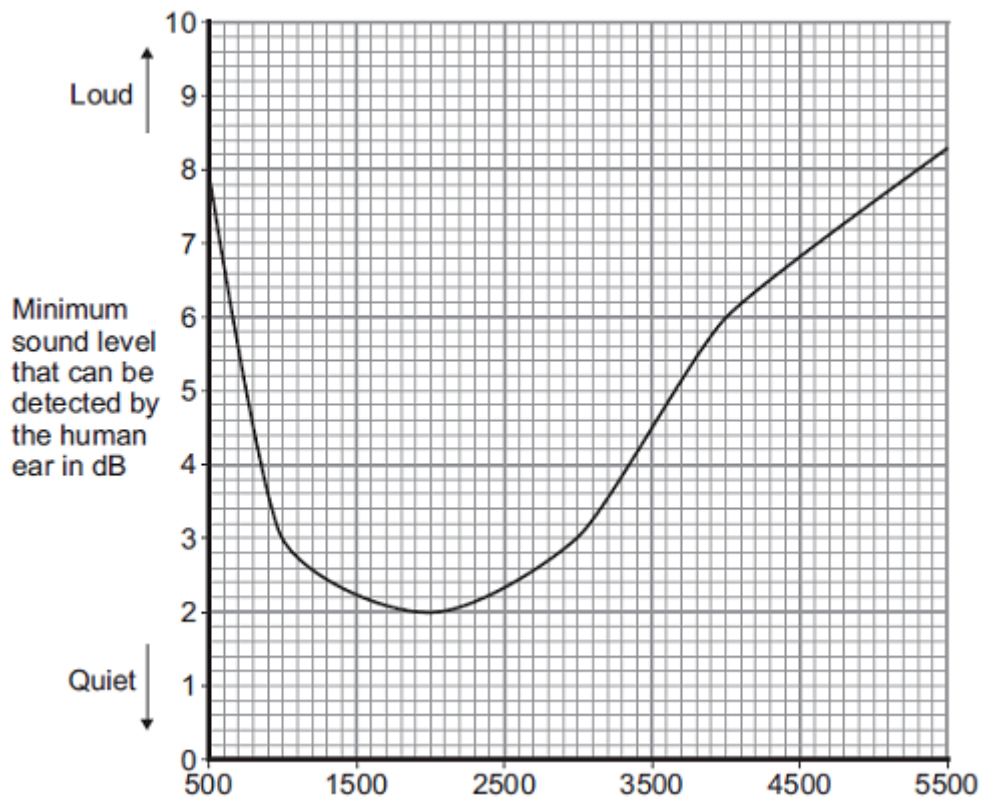
The table consists of two columns: 'Part' and 'Use'. Under 'Part', there are three boxes containing 'Microwaves', 'Radio waves', and 'Visible light'. Under 'Use', there are four boxes containing 'Photography', 'Remote controls', 'Mobile phones', and 'TV broadcasts'. Each box has a small square to its left for drawing a line.

(Total 3 marks)

**Q2.**

The human ear can detect a range of frequencies of sound.  
Sound level is measured in decibels, dB.

The figure below shows how the minimum sound level that can be detected by the human ear depends on the frequency of sound.



- (a) A sound has a frequency of 2000 Hz.

What is the minimum sound level needed to detect the sound?

Minimum sound level: \_\_\_\_\_ dB

(1)

- (b) Which frequency shown in the figure above would require the loudest sound before it could be heard?

Frequency: \_\_\_\_\_ Hz

(1)

- (c) The lowest frequency of sound the human ear can detect is 20 Hz. The wavelength of a sound wave with a frequency of 20 Hz is 17 metres.

Calculate the speed of a sound wave with a frequency of 20 Hz.

Use the correct equation from the Physics Equations Sheet.

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Speed = \_\_\_\_\_ m / s

(2)

- (d) Sound waves can be reflected from a wall.

What name is given to reflected sound waves?

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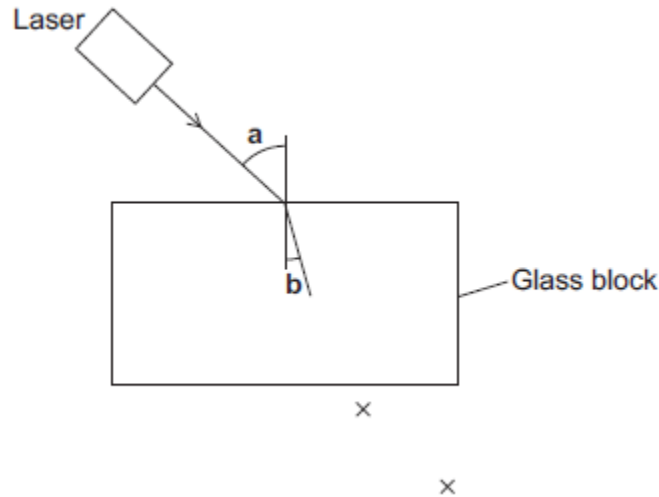
**Q3.**

A student used a laser to investigate the change of direction of light as it entered a glass block.

The apparatus is shown in **Figure 1**.

The path of a ray of light as it enters the glass block is shown.

**Figure 1**



(a) The student marked crosses to show the path of the ray of light that left the glass block.  
Use a ruler to help you to draw the path of the ray of light through and out of the glass block.

(2)

(b) Light from lasers can damage your eyes.

Suggest **one** safety precaution that the student should have taken during his investigation.

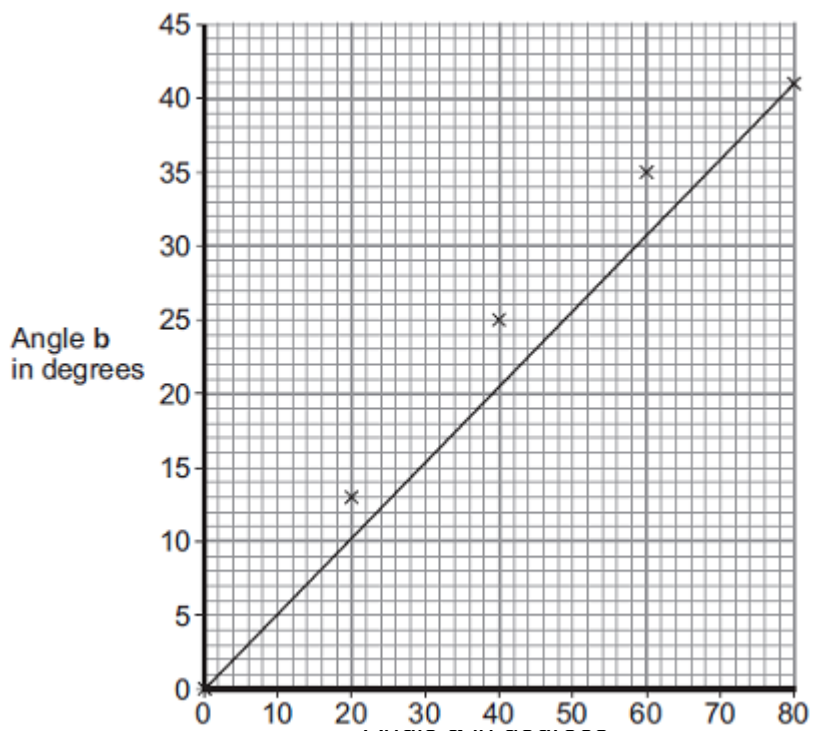
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(1)

(c) The student measured **angle a** and **angle b** when the ray of light was incident at 5 different angles. He measured each set of values once. The student's results are shown in **Figure 2**.

**Figure 2**



- (i) The student's line of best fit is **incorrect**.

Give **one** reason why.

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(1)

- (ii) The student measured 5 different values of **angle a** in his investigation.

Suggest **two** ways the student could improve his investigation.

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(2)

(Total 6 marks)

#### Q4.

The electromagnetic spectrum is made up of electromagnetic waves.

The electromagnetic waves form a continuous spectrum of different wavelengths.

- (a) Draw a ring around the correct answer to complete the sentence.

All electromagnetic waves are 

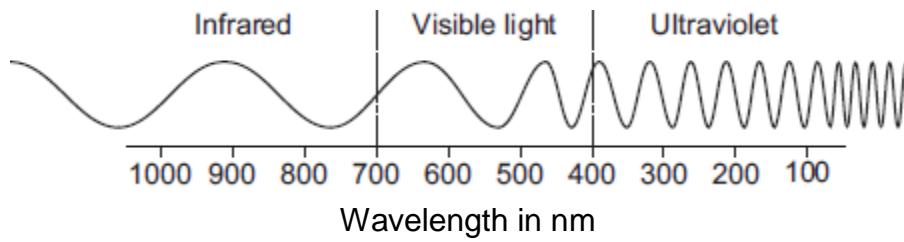
longitudinal
mechanical

 waves.

transverse

(1)

(b) Part of the electromagnetic spectrum is shown in the diagram.



(i) What is the range of wavelengths the human eye can detect?

The range is from \_\_\_\_\_ nm to \_\_\_\_\_ nm.

(2)

(ii) Draw a ring around the correct answer to complete the sentence.

As the frequency of the waves in the electromagnetic spectrum increases,

the wave speed

decreases.  
increases.  
stays the same.

(1)

(Total 4 marks)