

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

**Max. Marks : 23 Marks**

**Time : 23 Minutes**

**Q1.**

The figure below shows an X-ray image of a human skull.



Stockdevil/iStock/Thinkstock

- (a) Use the correct answers from the box to complete the sentence.

absorbs	ionises	reflects	transmits
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When X-rays enter the human body, soft tissue \_\_\_\_\_

X-rays and bone \_\_\_\_\_ X-rays.

(2)

- (b) Complete the following sentence.

The X-rays affect photographic film in the same way that \_\_\_\_\_ does.

(1)

- (c) The table below shows the total dose of X-rays received by the human body when different parts are X-rayed.

Part of body X-rayed	Dose of X-rays received by human body in arbitrary units
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Head	3
Chest	4
Pelvis	60

Calculate the number of head X-rays that are equal in dose to one pelvis X-ray.

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Number of head X-rays = \_\_\_\_\_

(2)

- (d) Which **one** of the following is another use of X-rays?

Tick (✓) **one** box.

Cleaning stained teeth

☐

Killing cancer cells

☐

Scanning of unborn babies

☐

(1)

(Total 6 marks)

## Q2.

- (a) Some humans are short-sighted.

Complete the following sentence.

Short sight can be caused by the eyeball being too \_\_\_\_\_ .

(1)

- (b) Spectacles can be worn to correct short sight.

The table below gives information about three different lenses that can be used in spectacles.

	Lens feature		
	Material	Mass in grams	Type
<b>Lens A</b>	Plastic	5.0	Concave (diverging)
<b>Lens B</b>	Glass	6.0	Convex (converging)
<b>Lens C</b>	Glass	5.5	Convex (converging)

Which lens from **Table 2** would be used to correct short sight?

Draw a ring around the correct answer.

**Lens A**

**Lens B**

**Lens C**

Give the reason for your answer.

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(2)

- (c) Every lens has a focal length.

Which factor affects the focal length of a lens?

Tick (✓) **one** box.

The colour of the lens

☐

The refractive index of the lens material

☐

The size of the object being viewed

☐

(1)

- (d) A lens has a focal length of 0.25 metres.

Calculate the power of the lens.

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Power of lens = \_\_\_\_\_ dioptries

(2)

- (e) Laser eye surgery can correct some types of eye defect.

Which of the following is another medical use for a laser?

Tick (✓) **one** box.

Cauterising open blood vessels

☐

Detecting broken bones

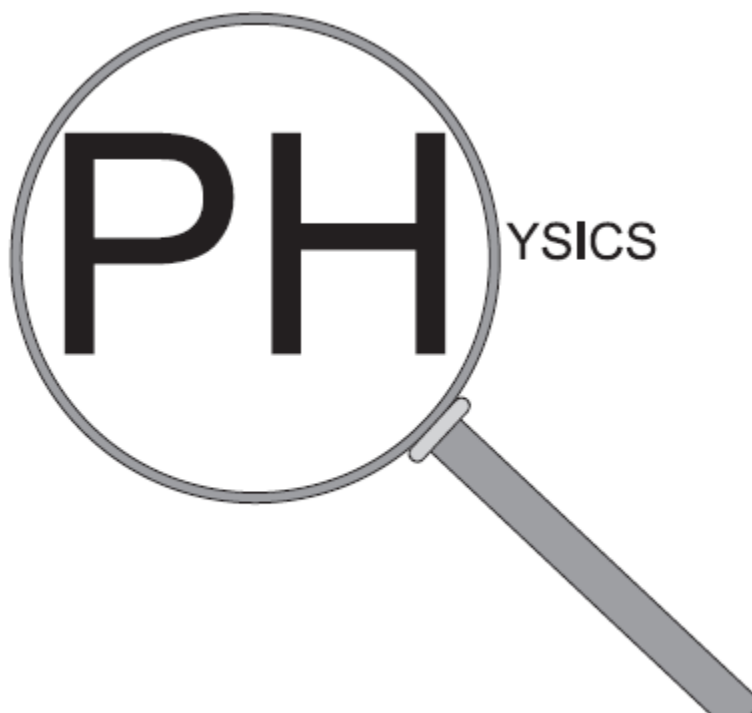
☐

Imaging the lungs

☐

(1)

- (f) The figure shows a convex lens being used as a magnifying glass.



Not to scale

An object of height 14 mm is viewed through a magnifying glass.

The image height is 70 mm.

Calculate the magnification produced by the lens in the magnifying glass.

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Magnification = \_\_\_\_\_

(2)

(Total 9 marks)

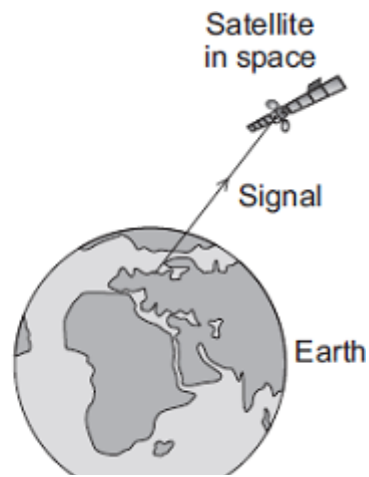
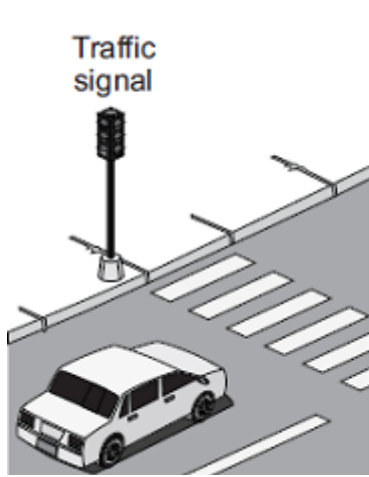
**Q3.**

**Diagram 1** shows four of the seven types of wave in the electromagnetic spectrum.

**Diagram 1**

J	K	L	Visible light	Infrared	Microwaves	Radio waves
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- (a) The **four** types of electromagnetic wave named in **Diagram 1** above are used for communication.



- (i) Which type of electromagnetic wave is used when a traffic signal communicates with a car driver?

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(1)

- (ii) Which type of electromagnetic wave is used to communicate with a satellite in space?

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(1)

- (b) Gamma rays are part of the electromagnetic spectrum.  
Which letter, **J**, **K** or **L**, shows the position of gamma rays in the electromagnetic spectrum?  
Draw a ring around the correct answer.

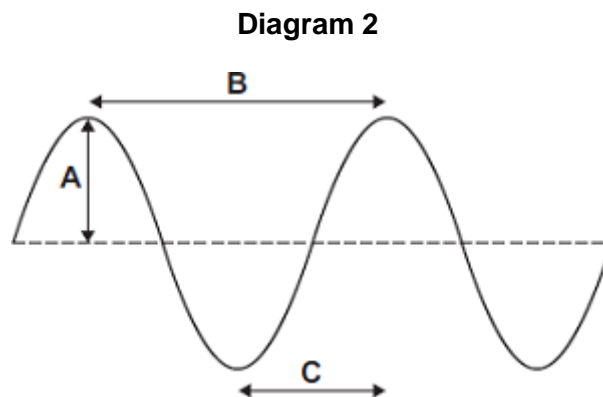
**J**

**K**

**L**

(1)

- (c) **Diagram 2** shows an infrared wave.



- (i) Which **one** of the arrows, labelled **A**, **B** or **C**, shows the wavelength of the wave?

Write the correct answer, **A**, **B** or **C**, in the box.

(1)

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

The wavelength of infrared waves is  
  
of radio waves.

shorter than  
the same as  
longer than

the wavelength

(1)

- (d) Mobile phone networks send signals using microwaves. Some people think the energy a person's head absorbs when using a mobile phone may be harmful to health.

- (i) Scientists have compared the health of people who use mobile phones with the health of people who do not use mobile phones.

Which **one** of the following statements gives a reason why scientists have done this?

Tick (✓) **one** box.

To find out if using a mobile phone is harmful to health.

☐

To find out if mobile phones give out radiation.

☐

To find out why some people are healthy.

☐

(1)

- (ii) The table gives the specific absorption rate (SAR) value for two different mobile phones.

The SAR value is a measure of the maximum energy a person's head absorbs when a mobile phone is used.

Mobile Phone	SAR value in W/kg
X	0.28
Y	1.35

A parent buys mobile phone **X** for her daughter.

Using the information in the table, suggest why buying mobile phone **X** was the best choice.

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(2)  
(Total 8 marks)