

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

**Max. Marks : 24 Marks**

**Time : 24 Minutes**

Q1.

**Answer the question with a cross in the box you think is correct  . If you change your mind about an answer, put a line through the box  and then mark your new answer with a cross  .**

This question is about light.

White light includes all the colours in the visible spectrum.

A beam of white light is the only light that shines on a book.

The book appears green.

A red filter is placed between the source of white light and the book.

What colour does the book appear now?

(1)

- A** black
- B** blue
- C** green
- D** red

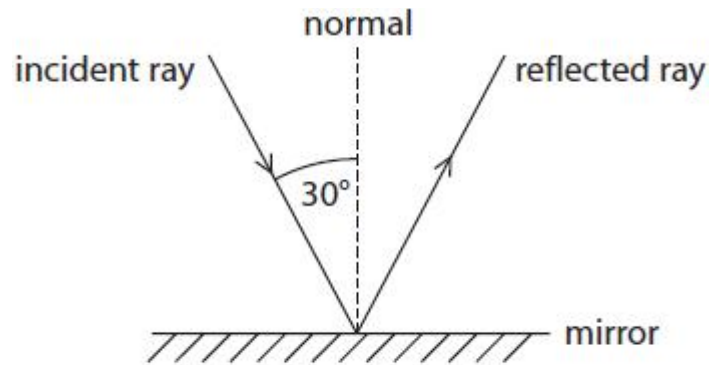
**(Total for question = 1 mark)**

Q2.

Answer the question with a cross in the box you think is correct . If you change your mind about an answer, put a line through the box  and then mark your new answer with a cross .

Figure 3 shows a ray of light striking a mirror.

The angle of incidence is  $30^\circ$  and the ray of light is reflected.



**Figure 3**

The angle of reflection is the angle between

(1)

- A** the mirror and the incident ray
- B** the mirror and the normal
- C** the reflected ray and the incident ray
- D** the reflected ray and the normal

(Total for question = 1 mark)

Q3.

Which colour of visible light has the longest wavelength?

(1)

- A blue
- B green
- C red
- D yellow

**(Total for question = 1 mark)**

Q4.

Answer the question with a cross in the box you think is correct . If you change your mind about an answer, put a line through the box  and then mark your new answer with a cross .

Ultraviolet light has a higher frequency than infrared light.

Which of these colours of visible light has the highest frequency?

(1)

- A blue
- B green
- C orange
- D yellow

(Total for question = 1 mark)

Q5.

This question is about the electromagnetic spectrum.

X-rays and microwaves are both parts of the electromagnetic spectrum.

Use words from the box to complete the sentences.

(3)

**amplitude frequency longitudinal speed transverse wavelength**

X-rays and microwaves are both ..... waves.

In a vacuum, x-rays and microwaves always have the same .....

X-rays always have a higher ..... than microwaves.

**(Total for question = 3 marks)**

Q6.

Figure 9 shows an image taken at night using a camera that is sensitive to infrared radiation.



**Figure 9**

Radiation with shorter wavelengths shows as brighter areas in this image.

Explain why the people can be seen against the background in this image.

(2)

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.....

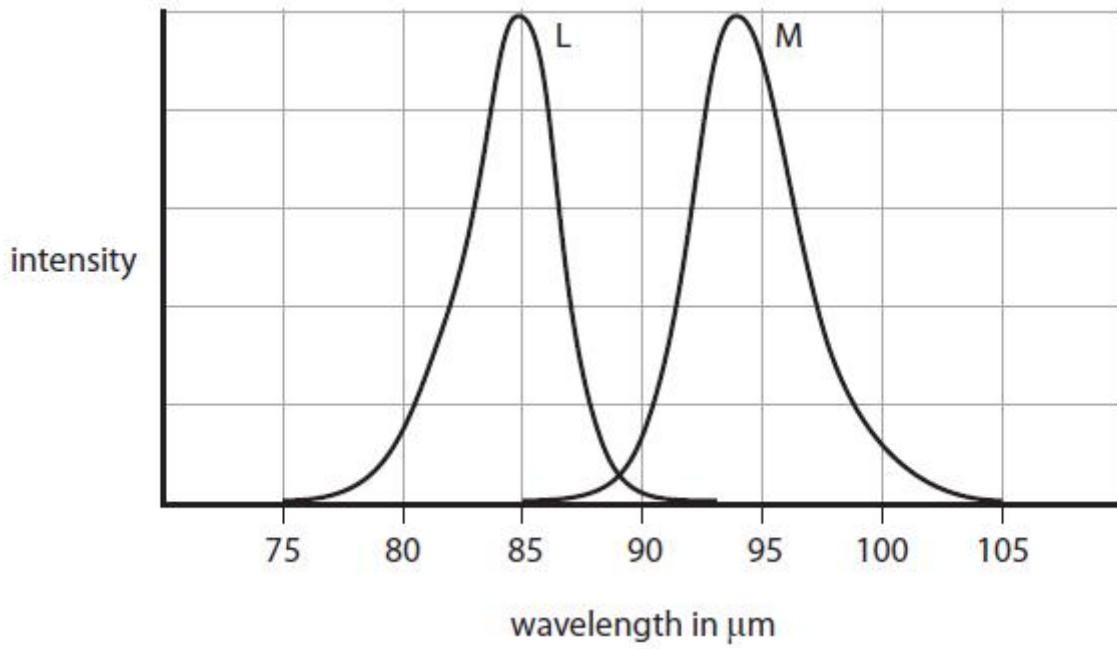
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**(Total for question = 2 marks)**

Q7.

Figure 5 is a graph showing the intensity–wavelength curves for two hot objects, L and M.



**Figure 5**

(i) Estimate the wavelength where the intensity is at a maximum for each of the objects.

(2)

wavelength at maximum intensity for object L = .....  $\mu\text{m}$

wavelength at maximum intensity for object M = .....  $\mu\text{m}$

(ii) State, with a reason, which object is the hotter object.

(1)

Object

.....

Reason.

.....

.....

**(Total for question = 3 marks)**

Q8.

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

Which of these is the biggest?

(1)

**A** the Solar System

**B** a galaxy

**C** a nebula

**D** the Universe

(b) These are four stages in the evolution of a star similar to the Sun.  
They are **not** in the correct order.

1. main sequence star
2. white dwarf
3. red giant
4. nebula

Write down the stages in the correct order.

(2)

The first stage has been done for you.

..... nebula .....

.....  
.....  
.....

(c) (i) The chart shows the electromagnetic (EM) spectrum.  
Some parts of the spectrum have been labelled.

radio	<b>P</b>	<b>Q</b>	visible light	<b>R</b>	<b>S</b>	gamma rays
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State the name of part **Q**.

(1)

(ii) Three telescopes using different parts of the spectrum have been added to the chart.

radio	<b>P</b>	<b>Q</b>	visible light	<b>R</b>	<b>S</b>	gamma rays
Jodrell Bank			Hubble			Compton

Jodrell Bank is located near Manchester, whereas Hubble and Compton are in space.

Explain why some telescopes are located outside the Earth's atmosphere.

(2)

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\*(d) Describe how modern telescopes have contributed to our understanding of the Universe.

(6)

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**(Total for Question is 12 marks)**