

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

Max. Marks : 18 Marks

Time : 18 Minutes

Q1.

Ultraviolet waves cover a range of frequencies.

Scientists divide this range into three types, UVA, UVB and UVC.

The table in Figure 14 shows the frequency range for each type.

type	frequency range in Hz
UVA	$7.5 \times 10^{14}$ to $9.4 \times 10^{14}$
UVB	$9.4 \times 10^{14}$ to $10 \times 10^{14}$
UVC	$10 \times 10^{14}$ to $30 \times 10^{14}$

Figure 14

Figure 15 is a diagram about the effect that the Earth's atmosphere has on three types of ultraviolet radiation.

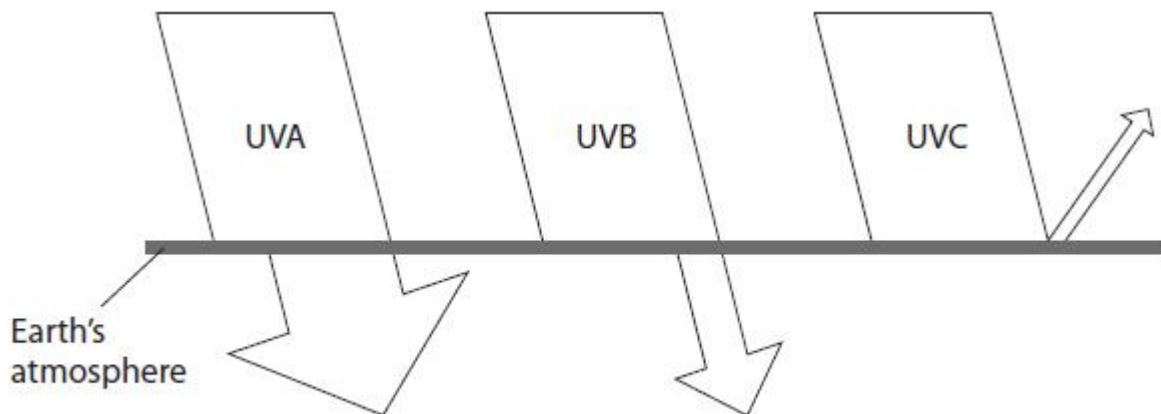


Figure 15

Describe how the effects change with **wavelength**, using information from Figure 14 and Figure 15.

The width of the arrows drawn indicates the amount of radiation that is involved.

Calculations are **not** required.

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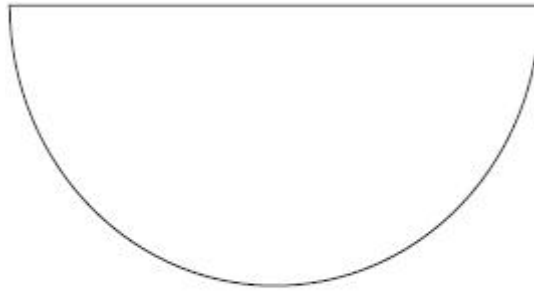
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**(Total for question = 4 marks)**

Q2.

Figure 3 shows a semicircular glass block.



**Figure 3**

Describe how a student could use the semicircular glass block and other apparatus to determine the critical angle for a glass-air boundary.

You should add to the diagram in Figure 3 to help with your answer.

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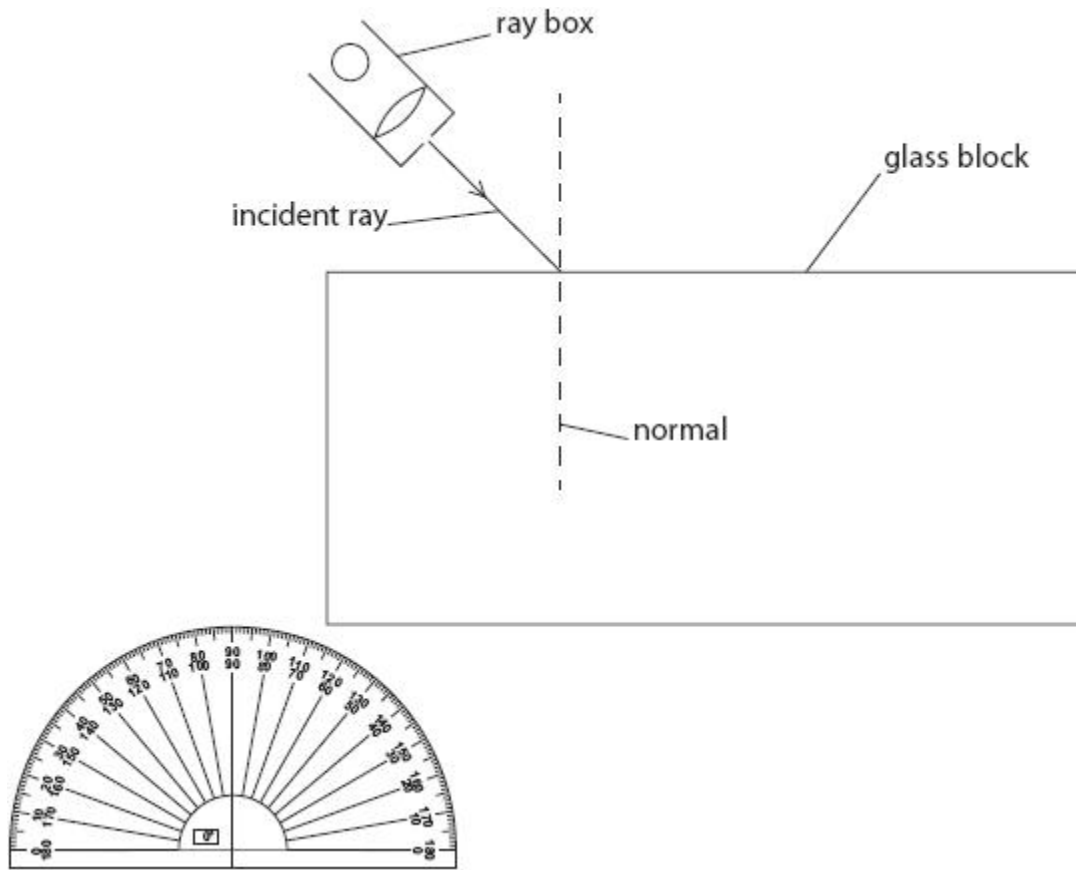
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**(Total for question = 4 marks)**

Q3.

A student investigates how the angle of refraction varies with the angle of incidence when light enters a glass block.



**Figure 1**

Describe how the student should perform this investigation.

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**(Total for question = 4 marks)**

Q4.

Microwaves are used to send and receive television signals from high orbit geostationary satellites.

Describe why microwaves rather than radio waves are used.

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

Q5.

Figure 1 is a ray diagram for a converging lens when used as a magnifying glass.

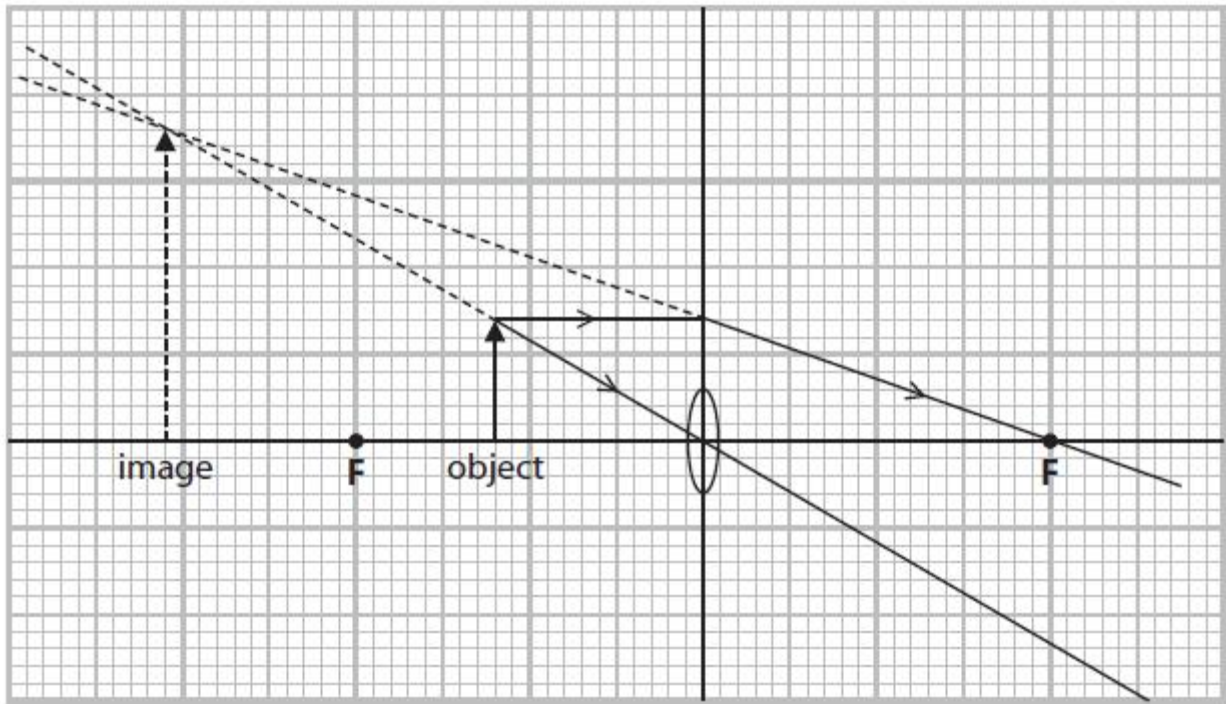


Figure 1

- (i) Using information from Figure 1, determine the magnification of the virtual image.  
Use the equation

$$\text{magnification} = \frac{\text{height of image}}{\text{height of object}}$$

(2)

magnification = .....

- (ii) Describe **one** way the magnification of the image could be increased.

(2)

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(Total for question = 4 marks)