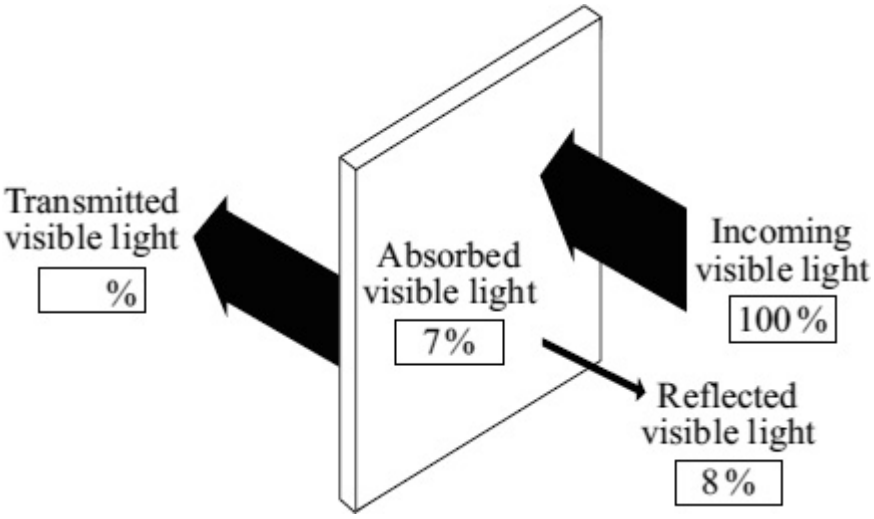
Name of the Student:_____
Max. Marks : 18 Marks **Time : 18 Minutes**

Q1.

Glass reflects, absorbs and transmits both infra red radiation and visible light.

(a) The diagram shows the percentages of visible light that are reflected and absorbed by one type of glass.

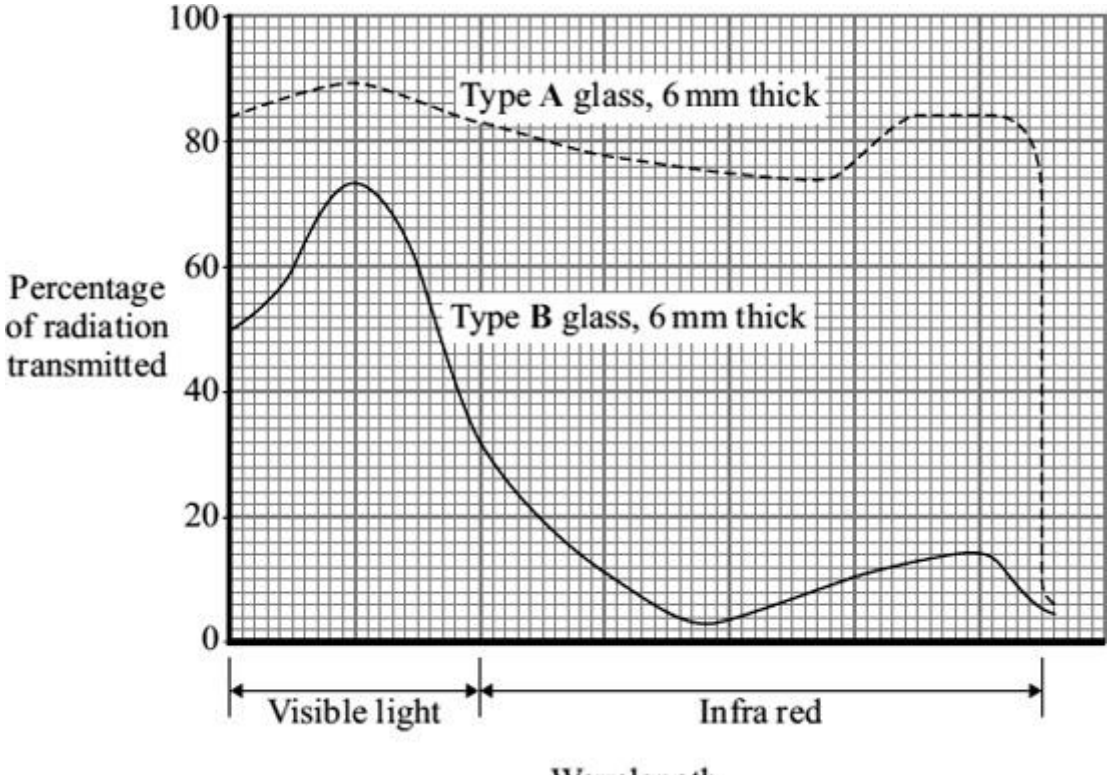


What percentage of visible light is transmitted by this type of glass?

_____ %

(1)

(b) The amounts of infra red radiation and visible light transmitted by glass depend on the type and thickness of glass. The data obtained from tests on two different types of glass is displayed in the graph below.



(i) To be able to compare the two types of glass, it was important to control one variable.

What variable was controlled in the tests?

_____

(1)

(ii) A homeowner has a glass conservatory built on the back of the house. The homeowner tells the builder that the inside of the conservatory should stay as cool as possible throughout the summer.

Explain why the builder uses 'type **B**' glass for the conservatory.

_____

_____

_____

_____

(2)

(Total 4 marks)

Q2.

(a) The table gives information about the frequencies in the hearing ranges of six different mammals.

Name of mammal	Frequencies in hearing range
Bat	20 Hz → 160 kHz

Dog	20 Hz → 30 kHz
Dolphin	40 Hz → 110 kHz
Elephant	5 Hz → 10 kHz
Human	20 Hz → 20 kHz
Tiger	30 Hz → 50 kHz

(i) Which mammal in the table can hear the highest frequency?

_____

(1)

(ii) Which mammal in the table, apart from humans, **cannot** hear ultrasound?

_____

(1)

(iii) Give **one** example of a frequency which an elephant can hear but which a tiger **cannot** hear.

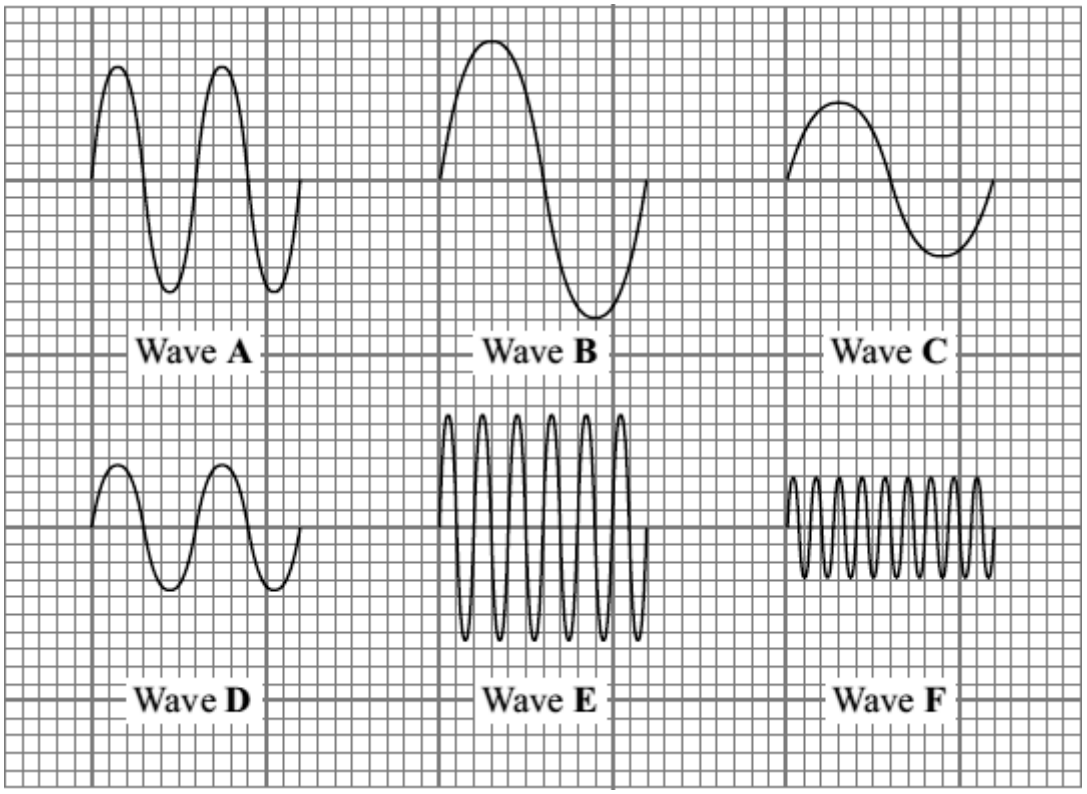
Include the unit in your answer.

Frequency _____

(1)

(b) The diagrams show six sound waves, **A**, **B**, **C**, **D**, **E** and **F**, represented on an oscilloscope screen.

They are all drawn to the same scale.



(i) Which **one** of the waves has the greatest amplitude?

Wave _____

(1)

(ii) Which **one** of the waves has the highest frequency?

Wave _____

(1)

(Total 5 marks)

Q3.

The diagram shows the seven types of wave that make up the electromagnetic spectrum.

Gamma rays	X-rays	Ultraviolet rays	Visible light	Infra red rays	Micro-waves	Radio waves

(a) (i) Microwaves and visible light can be used for communications.

Name **one** more type of electromagnetic wave that can be used for communications.

_____

(1)

(ii) Name **one** type of electromagnetic wave that has a longer wavelength than microwaves.

_____

(1)

(b) Wi-Fi is a system that joins a laptop computer to the internet without using wires.
A 2400 megahertz microwave signal is used to link a computer to a device called a router.

What quantity is measured in hertz?

Draw a ring around your answer.

frequency **wavelength** **wave speed**

(1)

(c) A politician commented on the increasing use of Wi-Fi. He said: 'I believe that these systems may be harmful to children.'

(i) Suggest **one** reason why more scientific research into the safety of Wi-Fi systems is needed.

_____

_____

(1)

(ii) Complete the following sentence by drawing a ring around the correct line in the box.

a fact.

What the politician said was

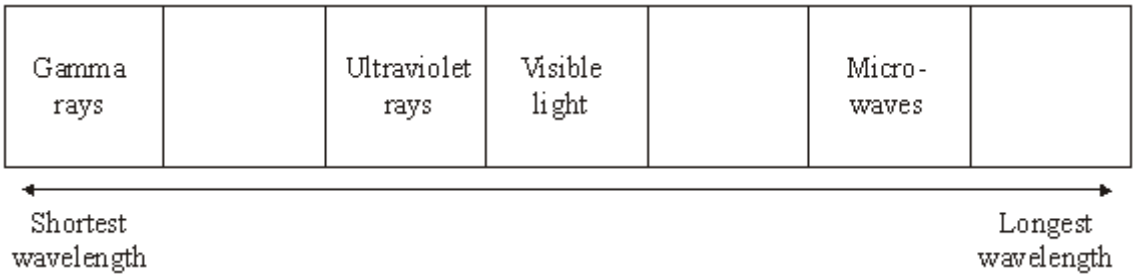
an opinion.
a prediction.

(1)

(Total 5 marks)

Q4.

The table shows the electromagnetic spectrum.
Three types of wave have been missed out.



(i) Use words from the box to complete the table.

infra red rays	**radio waves**	**X-rays**

(2)

(ii) Which **one** of the following gives a use of gamma rays?

Put a tick (✓) in the box next to your choice.

to communicate with satellites ☐

to see objects ☐

to kill cancer cells ☐

(1)

(iii) Complete the following sentence by drawing a ring around the correct word in the box.

All electromagnetic waves move

energy
gases
particles

from one place to another.

(1)

(Total 4 marks)