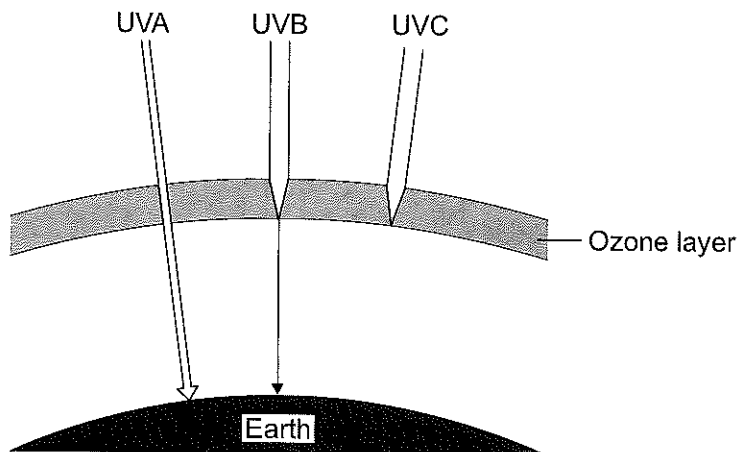


2 When outside, we need to protect our skin and eyes from the harmful effects of ultraviolet (UV) radiation. There are three types of UV radiation.

2 (a) The diagram shows the effect of the ozone layer on each of the three types of UV radiation. The width of the arrow represents the amount of UV radiation.



2 (a) (i) Which type of UV radiation will **not** have a harmful effect on our skin or eyes?

Draw a ring around your answer.

UVA

UVB

UVC

Give a reason for your answer.

.....

.....

(2 marks)

2 (a) (ii) The ozone layer above some places on the Earth's surface is very thin.

Explain the effect of a decrease in the thickness of the ozone layer on the risk to health from UV radiation, for people living at these places.

.....

.....

.....

.....

(2 marks)

Question 2 continues on the next page

Turn over ►



- 2 (b) Scientists have investigated the effect that the type of ground surface has on the amount of UV radiation entering the eye.

Two dummies, each fitted with UV sensors in the eyes, were used to measure the intensity of the UV radiation over the same period of time. The measurements were taken with one dummy facing the Sun, and the other dummy facing away from the Sun.

Measurements were taken in two places, one on a snow-covered area, the other on a sandy beach.

The results of their investigation are given in the table.

Position of the dummy head	Intensity of UV radiation in the snow-covered area in arbitrary units	Intensity of UV radiation in the sandy beach area in arbitrary units
Facing the Sun	650	250
Facing away from the Sun	520	50

- 2 (b) (i) What was the independent variable in this investigation?

.....
(1 mark)

- 2 (b) (ii) How could the reliability of the data collected in this investigation have been improved?

.....
.....
(1 mark)

- 2 (b) (iii) Some of the UV radiation measured by the sensors has been reflected from the surface of the ground.

Which surface is the best reflector of UV radiation, sand or snow?

Draw a ring around your answer. **sand** **snow**

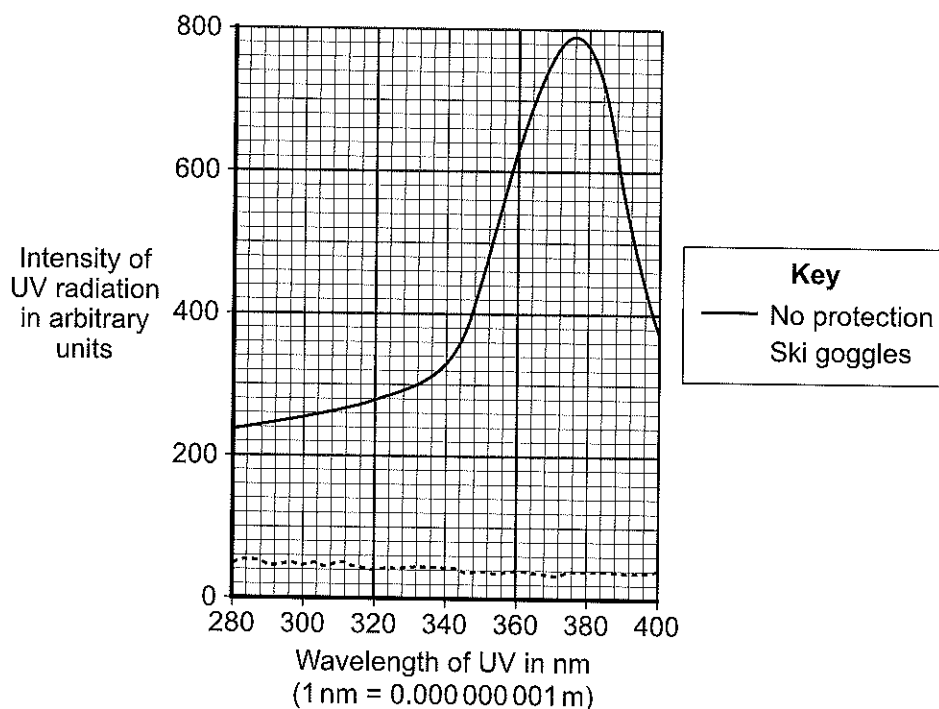
Give **one** reason for your answer.

.....
.....
(1 mark)



2 (c) Ski goggles are designed to block UV radiation. The manufacturer of one brand of ski goggles claims that the goggles block 100% of all UV radiation. These goggles were tested using UV radiation with a range of different wavelengths.

The results of the test are shown in the graph.



Do the results of the test support the claim made by the manufacturer?

Draw a ring around your answer. **Yes** **No**

Explain the reason for your answer.

.....

.....

.....

.....

(2 marks)

9

Turn over ►



5 (a) The wavelengths of four different types of electromagnetic wave, including visible light waves, are given in the table.

Type of wave	Wavelength
Visible light	0.0005 mm
A	1.1 km
B	100 mm
C	0.18 mm

Which of the waves, **A**, **B**, or **C**, is an infra red wave?

.....

(1 mark)

5 (b) A TV station broadcasts at 500 000 kHz. The waves travel through the air at 300 000 000 m/s.

Use the equation in the box to calculate the wavelength of the waves broadcast by this station.

$\text{wave speed} = \text{frequency} \times \text{wavelength}$

Show clearly how you work out your answer.

.....

Wavelength = m
 (2 marks)

5 (c) What happens when a metal aerial absorbs radio waves?

.....

(2 marks)



- 5 (d) Stars emit all types of electromagnetic waves. Telescopes that monitor X-rays are mounted on satellites in space.

Why would an X-ray telescope based on Earth **not** be able to detect X-rays emitted from distant stars?

.....
.....

(1 mark)

6

Turn over for the next question

Turn over ►

