



Oxford Cambridge and RSA

## **GCSE Physics B (Twenty First Century Science)**

**J259/01** Breadth in Physics (Foundation Tier)

### **Question Set 16**

Multiple Choice Questions

1

A solar flare is an explosion on the surface of the Sun.

(a) Solar flares release huge amounts of radiation, including visible light and X-rays.

(i) Which statement is true?

Tick (✓) **one** box.

Visible light is ionising radiation.

Visible light has a higher frequency than X-rays.

X-rays have a shorter wavelength than visible light.

X-rays are longitudinal waves.

[1]

(ii) Why can humans see visible light but not X-rays?

Tick (✓) **one** box.

Our eyes can detect only a small range of frequencies.

X-rays cannot travel through space towards the Earth.

Our eyes cannot detect electromagnetic waves.

X-rays are absorbed by the atmosphere of the Sun.

[1]

(b) The speed of visible light in empty space is 300 000 km/s.

The distance from the Sun to the Earth is 150 000 000 km.

Speed can be calculated using the equation: speed = distance ÷ time

(i) Which is the correct way to calculate the **time** for visible light from a solar flare to reach the Earth?

Put a ring around the correct calculation.

$$\frac{150\,000\,000}{300\,000}$$

$$\frac{300\,000}{150\,000\,000}$$

$$300\,000 \times 150\,000\,000$$

[1]

(ii) When do the X-rays from the solar flare reach the Earth?

Tick (✓) **one** box.

After the visible light.

At the same time as the solar flare happens.

At the same time as the visible light.

Before the visible light.

[1]

(iii) Explain your answer to (b)(ii).

[1]

All electromagnetic waves travel at the same speed in a vacuum

**Total Marks for Question Set 16: 5**

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