Electromagnetic Spectrum – 2021 IGCSE 0625

1. Nov/2021/QPaper_11/No.22

Radiation from which part of the electromagnetic spectrum is used in the remote controller for a television?

A infrared waves

B microwaves

C radio waves

D ultraviolet waves

2. Nov/2021/QPaper_11/No.23

Two rays of light are different colours.

Which row is correct?

	speed of the two colours in a vacuum	wavelengths of the two colours in a vacuum
A	different	different
B	different	the same
C	the same	different
D	the same	the same

3. Nov/2021/QPaper_12/No.22

Visible light, X-rays and microwaves are all components of the electromagnetic spectrum.

Which statement about the waves is correct?

A In a vacuum, microwaves travel faster than visible light and have a shorter wavelength.

B In a vacuum, microwaves travel at the same speed as visible light and have a shorter wavelength.

C In a vacuum, X-rays travel faster than visible light and have a shorter wavelength.

D In a vacuum, X-rays travel at the same speed as visible light and have a shorter wavelength.

4. Nov/2021/QPaper_12/No.23

Which radiation has a higher frequency than red light?

A ultraviolet

B radio waves

C microwaves

D infrared

5. Nov/2021/QPaper_13/No.22

Visible light, X-rays and microwaves are all components of the electromagnetic spectrum.

Which statement about the waves is correct?

A In a vacuum, microwaves travel faster than visible light and have a shorter wavelength.

B In a vacuum, microwaves travel at the same speed as visible light and have a shorter wavelength.

C In a vacuum, X-rays travel faster than visible light and have a shorter wavelength.

D In a vacuum, X-rays travel at the same speed as visible light and have a shorter wavelength.

6. Nov/2021/QPaper_21,22&23/No.22

The Sun emits infrared radiation and light.

Light from the Sun reaches the Earth in 8 minutes.

Which row gives correct information about the infrared radiation?

	wavelength of infrared radiation	time taken for infrared radiation to reach the Earth
A	longer than wavelength of light	8 minutes
B	longer than wavelength of light	much less than 8 minutes
C	shorter than wavelength of light	8 minutes
D	shorter than wavelength of light	much more than 8 minutes

7. Nov/2021/QPaper_21/No.23

Which list shows regions of the electromagnetic spectrum in order of increasing frequency?

A X-ray → ultraviolet → visible light → infrared

B X-ray → infrared → visible light → ultraviolet

C infrared → visible light → ultraviolet → X-ray

D ultraviolet → visible light → infrared → X-ray

8. Nov/2021/QPaper_22/No.23

Which statement about electromagnetic waves is **not** correct?

A They travel at 3×10^8 m/s in a vacuum.

B They transfer energy.

C They travel at 340 m/s in air.

D They are transverse waves.

9. Nov/2021/QPaper_31/No.7

Fig. 7.1 shows a ray of red light entering a semicircular glass block. The ray strikes the flat surface of the block at X and emerges into the air. Fig. 7.1 does not show the path of the refracted ray in the air.

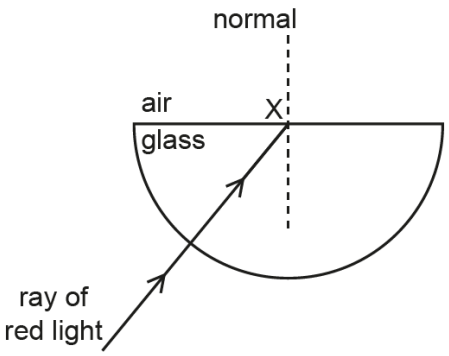

Fig. 7.1

(a) On Fig. 7.1:

(i) draw the path of the refracted ray in the air [1]

(ii) mark, and label with the letter *i*, the angle of incidence [1]

(iii) mark, and label with the letter *r*, the angle of refraction. [1]

(b) When the angle of incidence at X is 70°, the ray does **not** emerge from the glass into the air.

State what happens to the ray at X and explain why this happens.

.....

.....

..... [2]

(c) Visible light is one part of the electromagnetic spectrum. X-rays are also part of the electromagnetic spectrum.

(i) Visible light and X-rays are travelling through a vacuum.

Compare their speed and frequency by completing the sentences.

The speed of visible light is ..... the speed of X-rays.

The frequency of visible light is ..... the frequency of X-rays. [2]

(ii) Describe **one** use of X-rays.

..... [1]

[Total: 8]

10. Nov/2021/QPaper_41/No.6

X-rays are electromagnetic waves. Fig. 6.1 shows the position of X-rays in the electromagnetic spectrum arranged according to increasing wavelength.

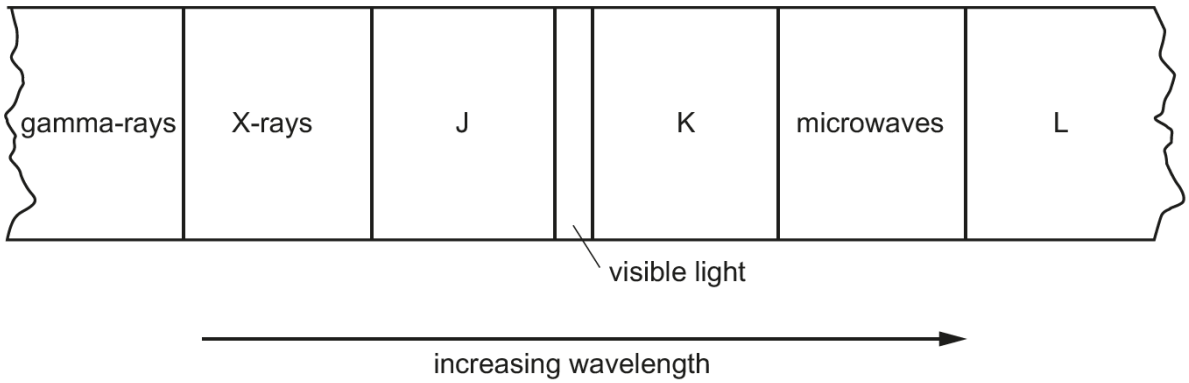

Fig. 6.1

(a) Three components of the spectrum are unnamed but labelled J, K and L.

(i) State the names of these three components.

J .....

K .....

L .....

[2]

(ii) State which of these three components has the lowest frequency.

..... [1]

(b) Calculate the frequency of X-rays that have a wavelength of 1.2×10^{-9} m in a vacuum.

frequency = ... [3]

(c) **(i)** Describe **one** medical use of X-rays.

.....

.....

.....

.....

..... [3]

(ii) State **one** reason why it is necessary to take safety precautions when X-rays are used.

.....

..... [1]

[Total: 10]