

Q1.(2018)

a)

**Figure 10** shows the position of three types of wave in the electromagnetic spectrum.

**Figure 10**

|             |   |   |   |             |        |   |
|-------------|---|---|---|-------------|--------|---|
| Radio waves | A | B | C | Ultraviolet | X-rays | D |
|-------------|---|---|---|-------------|--------|---|

Which position shows where visible light is in the spectrum?

Tick **one** box.

**[1 mark]**

A ☐      B ☐      C ☐      D ☐

b)

Which **one** of the statements about electromagnetic waves is correct?

Tick **one** box.

**[1 mark]**

Radio waves have a higher frequency than X-rays.

☐

Radio waves have a longer wavelength than ultraviolet.

☐

X-rays have a longer wavelength than radio waves.

☐

X-rays travel faster through the air than ultraviolet.

☐

c)

Give **one** possible danger of exposing your skin to ultraviolet radiation.

**[1 mark]**

---



---

d)

Having an X-ray taken exposes a person to ionising radiation.

**Table 3** gives the average radiation dose for an X-ray of the chest and an X-ray of the upper digestive system.

**Table 3**

| Part of the body       | Radiation dose in millisieverts (mSv) |
|------------------------|---------------------------------------|
| Upper digestive system | 5.0                                   |
| Chest                  | 0.1                                   |

The risk of an X-ray causing cancer is about 1 in 20 000 for each mSv of radiation received.

Compare the risk of developing cancer from having an X-ray of the upper digestive system with the risk from having an X-ray of the chest.

Use the data in **Table 3**.

**[2 marks]**

---



---

Q2.(2019)

**Figure 11** shows the position of three types of wave in the electromagnetic spectrum.

**Figure 11**

|          |            |          |               |          |          |            |
|----------|------------|----------|---------------|----------|----------|------------|
| <b>A</b> | Microwaves | <b>B</b> | Visible light | <b>C</b> | <b>D</b> | Gamma rays |
|----------|------------|----------|---------------|----------|----------|------------|

Which letter represents infrared in the electromagnetic spectrum?

**[1 mark]**

Tick (✓) **one** box.

**A** ☐
**B** ☐
**C** ☐
**D** ☐

Q3.(2020)

**Figure 10** shows the position of three types of wave in the electromagnetic spectrum.

**Figure 10**

|          |            |          |               |          |          |            |
|----------|------------|----------|---------------|----------|----------|------------|
| <b>A</b> | Microwaves | <b>B</b> | Visible light | <b>C</b> | <b>D</b> | Gamma rays |
|----------|------------|----------|---------------|----------|----------|------------|

Which letter represents the position of X-rays in the electromagnetic spectrum?

**[1 mark]**

Tick (✓) **one** box.

**A** ☐      **B** ☐      **C** ☐      **D** ☐

Q4.(2021)

There are different groups of waves in the electromagnetic spectrum.

**Figure 8** shows the position of three groups of the waves.

**Figure 8**

|          |            |          |               |          |          |            |
|----------|------------|----------|---------------|----------|----------|------------|
| <b>A</b> | Microwaves | <b>B</b> | Visible light | <b>C</b> | <b>D</b> | Gamma rays |
|----------|------------|----------|---------------|----------|----------|------------|

Which letter shows the position of infrared?

**[1 mark]**

Tick (✓) **one** box.

**A** ☐      **B** ☐      **C** ☐      **D** ☐

Q5.(2022)

a)

**Figure 9** shows parts of the electromagnetic spectrum.

**Figure 9**

|             |   |   |   |   |        |            |
|-------------|---|---|---|---|--------|------------|
| Radio waves | A | B | C | D | X-rays | Gamma rays |
|-------------|---|---|---|---|--------|------------|

Which letters represent the positions of ultraviolet and visible light in the electromagnetic spectrum?

**[2 marks]**

Ultraviolet \_\_\_\_\_

Visible light \_\_\_\_\_

b)

**Table 3** shows the range of wavelengths for different types of ultraviolet.

**Table 3**

| Type                | Range of wavelength in nanometres |
|---------------------|-----------------------------------|
| Ultraviolet A (UVA) | 315–400                           |
| Ultraviolet B (UVB) | 280–315                           |
| Ultraviolet C (UVC) | 100–280                           |

Determine which type of ultraviolet shown in **Table 3** has the largest range of wavelengths.

To gain full marks you must calculate the range of wavelengths for each type of ultraviolet.

**[3 marks]**

---



---



---



---

Type of ultraviolet with the largest range of wavelengths \_\_\_\_\_