The Electromagnetic Spectrum

Waves · 4 questions · step-by-step answers at the end

Name: Date: Score: / 4

USEFUL EQUATIONS

$v = f\lambda$

Questions

Show your working in the space under each question.

1. Which has the longer wavelength, infrared or ultraviolet? Which carries more energy?

2. A microwave oven uses waves of frequency 2.45×10^9 Hz. Find the wavelength.

3. Why do radiographers leave the room when taking an X-ray?

4. Which part of the spectrum do night-vision cameras detect?

Step-by-step answers

The Electromagnetic Spectrum

1. **Infrared** has the longer wavelength; **ultraviolet** carries more energy.
2. 1. $\lambda = v/f = 3.0 \times 10^8 / 2.45 \times 10^9$.
   2. $\lambda =$ **0.12 m** (12 cm).
   Answer: 0.12 m
3. X-rays are **ionising**. One dose is low risk, but repeated daily exposure would be harmful.
4. **Infrared**, which warm objects emit.