0 7   A baby monitor has a sensor unit that transmits an image of the baby and the noises the baby makes to a monitor unit.

The monitor unit then displays an image of the baby and emits the noises the baby makes.

0 7 . **1**   Compare the properties of the waves that transmit images and noises from the monitor unit.

[4 marks]

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0 7 . 2 The sensor unit can detect infrared and visible light.

Suggest **one** advantage of being able to detect infrared.

[1 mark]

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0 7 . 3 Write down the equation that links frequency, wave speed and wavelength.

[1 mark]

Equation _____

0 7 . 4 The signals for the monitor unit are transmitted as electromagnetic waves with a wavelength of 0.125 m.

Wave speed of electromagnetic waves = 3×10^8 m/s

Calculate the frequency of the signal.

[3 marks]

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Frequency = _____ Hz

END OF QUESTIONS

Question 7

Question	Answers	Extra information	Mark	AO / Spec. Ref.
07.1	any **four** from: • light waves are transverse whereas sound waves are longitudinal • light waves travel faster than sound waves • light waves have a higher frequency than sound waves • light waves have a shorter wavelength than sound waves • light waves have oscillations perpendicular (to the direction of energy transfer) whereas sound waves are parallel (to the direction of energy transfer)		4	AO1/1 6.6.1.1 6.6.1.2 6.6.2.1 WS 1.4
07.2	the baby can be seen in the dark		1	AO2/1 6.6.2.4 WS1.4
07.3	wave speed = frequency × wavelength	accept $v = f\lambda$	1	AO1/1 6.6.1.2
07.4	$3 \times 10^8 = f \times 0.125$ $f = 3 \times 10^8 / 0.125$ $f = 2.4 \times 10^9$ (Hz)	 allow 2.4×10^9 with no working for **3** marks	1 1 1	AO2/1 6.6.1.2 WS3.3
Total			**9**	