

Question number	Answer	Notes	Marks
2 (a)	D (ultraviolet); A is incorrect because frequencies lower than visible light are non-ionising B is incorrect because frequencies lower than visible light are non-ionising C is incorrect because frequencies lower than visible light are non-ionising		1
(b)	one use for x-rays; e.g. taking photos or detecting of (broken) bones, internal structures (of objects), one use for gamma rays; e.g. radiotherapy, sterilising medical equipment, reference to tracing, airport scanning of luggage, irradiating food (for preservation)	allow treating cancer / sterilising medical equipment allow treating cancer	2
(c) (i)	speed = frequency \times wavelength;	allow standard symbols and rearrangements e.g. $\lambda = v / f$ condone s for speed	1
(ii)	substitution; rearrangement; evaluation; e.g. $3.0 \times 10^8 = 2.8 \times 10^{19} \times \text{wavelength}$ wavelength = speed / frequency (wavelength =) 1.1×10^{-11} (m)	-1 for POT error allow $1.07... \times 10^{-11}$ (m)	3
(d)	B; A is incorrect because it shows an exponential relationship C is incorrect because it shows a proportional relationship D is incorrect because it shows no relationship		1

Total for Question 2 = 8 marks