


Name of the Student: _____

Max. Marks : 11 Marks

Time : 11 Minutes

Mark Schemes

Q1.

Question number	Answer	Mark
	<input checked="" type="checkbox"/> C  Only this is the correct symbol for a thermistor	(1) AO1.1

Question Number	Answer	Acceptable answers	Mark
(a)(i)	<p>A suggestion linking two of:</p> <ul style="list-style-type: none"> • (X-rays/they) are harmful to health (1) • airport use non-essential/ hospital use essential (1) • idea that benefits outweigh risk in hospitals (1) 	<p>Dangerous to health/damage cells/ can cause cancer/mutate cells/ionising</p> <p>ORA</p> <p>Ignore references to risks of frequent flyers</p>	(2)

Question Number	Answer	Acceptable answers	Mark
(a)(ii)	<p>A suggestion linking:</p> <p>lead casing / shielding (1)</p> <p><u>absorbs</u> X-rays (1)</p>	<p>metal casing/shielding (security workers) out of range</p> <p>Ignore references to lead suits/aprons etc.</p>	(2)

Question Number	Answer	Acceptable answers	Mark
(b)(i)	<p>Explanation linking two of the following:-</p> <ul style="list-style-type: none"> • cathode is heated (1) • (electrons) given enough energy (1) • (electrons) escape (from the surface) (1) 	<p>filament/wire is heated</p> <p>boiled off / released / emitted</p> <p>Ignore emission</p>	(2)

Question Number	Answer	Acceptable answers	Mark
(b)(ii)	C 4.4×10^{16} (1)		(1)

Question Number	Answer	Acceptable answers	Mark
(b)(iii)	substitution: (1) $1.4 \times 10^{-14} = 1.6 \times 10^{-19} \times V$ Transposition (1) $(V) = 1.4 \times 10^{-14} / 1.6 \times 10^{-19}$ evaluation: (1) $88\,000\text{ (V)} / 88 \times 10^3\text{ (V)} / 8.8 \times 10^4\text{ (V)}$	substitution and transposition in any order ignore powers of 10 until evaluation $87\,500\text{ (V)}, 9 \times 10^4\text{ (V)}$ $88\text{ kV}, 87.5\text{ kV}, 90\text{ kV}$ full marks for the correct numerical answer without working	(3)

(Total marks for question = 10 marks)