Mark scheme

Question			Answer/Indicative content	Marks	Guidance
1		i	Handle the radioactive isotope using tongs. ☐ Move the radioactive isotope further away from the detector. ☐ Place lead in front of the radioactive isotope. ☐ Zero the counter and take another reading. ☑ ✓	1 (AO 3.3b)	**Examiner's Comments** Most of the candidates correctly identified that the last box was the correct answer. Across the range of marks other answers were observed. This was a question where candidates should be advised to read each statement and place a small cross to eliminate an incorrect statement.
		ii	8 (counts per second) ✓	1 (AO 1.2)	**ALLOW** 7.9(1) (candidate has subtracted 5 from activity in cpm) **Examiner's Comments** Most of the candidates gained the correct answer by dividing 480 by 60. A significant proportion of the candidates incorrectly multiplied 480 by 60.
			Total	**2**	
2		i	Electrons✓ Light✓	2 (2 × AO 1.1)	**Examiner's Comments** The majority of candidates scored 1 mark. The common errors were confusing atoms with electrons and sound with light.
		ii	**First check the answer on the answer line** **If answer = 240 (J) award 2 marks** (E =) 0.08 x 3000 ✓ (E =) 240 (J) ✓	2 (2 × AO 2.1)	**Examiner's Comments** The majority of candidates correctly multiplied the potential difference by the charge.
		iii	(Risk of) an (electric) shock / electrocution / **AW** ✓	1 (AO 3.2a)	**IGNORE** dangerous / injury / death unqualified **Examiner's Comments** There were many vague answers of the power supply being dangerous or causing death. It was expected that

					candidates would refer to the risk of electrocution or electric shock.
			Total	**5**	
3			A	1 (AO 2.1)	**Examiner's Comments** The majority of the candidates identified A as the correct answer. The majority of the incorrect answers were either C (confusing beta and gamma radiation) or D (thinking that alpha radiation can pass through paper).
			Total	**1**	
4			C	1 (AO 1.1)	**Examiner's Comments** This answer was generally well answered, although a range of incorrect choices were observed. **Assessment for learning** Candidates should be encouraged to learn basic definitions and practise applying their knowledge.
			Total	**1**	
5			C	1 (AO 1.1)	**Examiner's Comments** This question was generally well answered. A small minority of candidates chose either A or D. Perhaps candidates who selected D ignored the reference to nucleus in the question. **Assessment for learning** When practising answering multiple-choice questions, candidates should be encouraged to underline key terms in the question. In this case 'nucleus' and 'atom' were useful terms to highlight. Candidates should also be

					encouraged to consider each of the four answers and put small crosses next to answers they have 'ruled out'.
			Total	**1**	
6			D ✓	1 (AO2.1)	**Examiner's Comments** This question had a range of different responses. Candidates needed to understand the penetration of alpha, beta and gamma radiation with different materials.
			Total	**1**	