

Question number	Answer	Notes	Marks																				
1 (a)	B (124); A is incorrect because this is the number of protons C is incorrect because this is the number of protons and neutrons D is incorrect because this is twice the number of protons added to the neutrons		1																				
(b)	C (a high frequency electromagnetic wave); A is incorrect because this is the description of alpha radiation B is incorrect because this is the description of beta radiation D is incorrect because this is the description of neutron radiation		1																				
(c)	all 4 rows correct = 3 marks;;; 2-3 rows correct = 2 marks;;; any 1 row correct = 1 mark; <table border="1"> <thead> <tr> <th>Variable</th><th>Independent variable</th><th>Dependent variable</th><th>Control variable</th></tr> </thead> <tbody> <tr> <td>count measured using the detector</td><td></td><td>✓</td><td></td></tr> <tr> <td>distance between source and detector</td><td></td><td></td><td>✓</td></tr> <tr> <td>number of lead sheets</td><td>✓</td><td></td><td></td></tr> <tr> <td>time period for measuring the count</td><td></td><td></td><td>✓</td></tr> </tbody> </table> more than one tick in a row negates the mark for that row	Variable	Independent variable	Dependent variable	Control variable	count measured using the detector		✓		distance between source and detector			✓	number of lead sheets	✓			time period for measuring the count			✓		3
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Total for Question 1 = 5 marks

Question number	Answer	Notes	Marks
4 (a)	both have magnitude; (only) vectors have a direction;		2
(b)	charge; power; temperature;	if 4 circled, 2 marks max. if 5-6 circled, 1 mark max. no marks if all circled	3
(c)	(resultant force =) 6 (N); (direction =) left;	ignore sign allow indication of same direction as 8 (N) force condone West	2

Total for Question 4 = 7 marks