

Q1. (2018)

06.1	electron		1	AO1 6.4.1.3 5.1.1.3
	atom		1	
	nucleus		1	
	orbit		1	

Q2. (2018)

06.3		an answer of 21 000 000 scores 2 marks		AO2 6.4.1.3
	$v = 300\,000\,000 \times \left(\frac{7}{100}\right)$	allow any correct method of determining 7% of 300 000 000	1	
	$v = 21\,000\,000 \text{ (m/s)}$	allow $2.1 \times 10^7 \text{ (m/s)}$	1	

Q3. (2018)

06.4		an answer in the range 1.4×10^{-10} to 1.6×10^{-10} scores 2 marks		AO2 6.4.1.1
	$r = 6 \times 2.5 \times 10^{-11}$	allow a ratio in the range of 5.7–6.3 or measurements that would give this range, correctly substituted	1	
	$r = 1.5 \times 10^{-10} \text{ (m)}$	allow 1.4×10^{-10} to 1.6×10^{-10} their ratio $\times 2.5 \times 10^{-11}$ correctly calculated scores 1 mark	1	

Q4. (2019)

a)

03.1	they changed direction	allow deflected/reflected/repelled	1	AO 1/1 6.4.1.3	E
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b)

03.2		an answer of 0.000 03 (nm) or $3.0 \times 10^{-5} \text{ (nm)}$ scores 2 marks		AO2/2 6.4.1.1	E
	diameter = $\frac{0.18}{6000}$		1		
	= 0.000 030 (nm)	allow $3.0 \times 10^{-5} \text{ (nm)}$	1		

Q5. (2024)

a)

07.3	Level 2: Scientifically relevant facts, events or processes are identified and given in detail to form an accurate account.	4–6	AO1 AO3 6.4.1.3
	Level 1: Facts, events or processes are identified and simply stated but their relevance is not clear.	1–3	
	No relevant content	0	
	Indicative content Plum pudding model <ul style="list-style-type: none"> the atom is a ball of positive charge electrons are embedded in the ball Reasons why the plum pudding model was replaced <ul style="list-style-type: none"> the results were not correctly predicted by the plum pudding model the plum pudding model did not predict that some particles would be deflected the large angle deflections suggest that the atom contains a nucleus all deflections suggest that the nucleus is charged most alpha particles were not deflected suggesting that atoms are mostly empty space Nuclear model <ul style="list-style-type: none"> mass is concentrated in the nucleus the nucleus is charged the atom is mostly empty space electrons orbit the nucleus in the nuclear model 		

b)

07.4	James Chadwick	1	AO1 6.4.1.3
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