




Atomic structure – *Mark scheme*

1.	(a)	(i)	B	<i>for one mark</i>	1
		(ii)	has 4 electrons / protons others only 3; B has a different no. of electrons / protons - <i>not</i> A and C have same no. of protons / electrons	<i>for one mark</i>	1
	(b)	(i)	A and C	<i>for one mark</i>	1
		(ii)	same no. of protons / electrons; different no. of neutrons		2
		<b>or</b>	nuclei have the same charge but different mass	<i>for 1 mark each</i>	
	(c)	(i)			3
		(ii)			
		(iii)		<i>for 1 mark each</i>	
2.	(a)	any <b>two</b> pairs from:			4
		•	nuclear model mass is concentrated at the centre / nucleus (1) plum pudding model mass is evenly distributed (1) <i>accept the nuclear model has a nucleus/the plum pudding model does not have a nucleus for 1 mark</i>		
		•	nuclear model positive charge occupies only a small part of the atom (1) plum pudding model positive charge spread throughout the atom (1) <i>accept electrons in shells/ orbits provided a valid comparison is made with the plum pudding model</i> <i>do not accept on its own; do not accept electrons at edge of plum pudding</i>		
		•	nuclear model electrons orbit some distance from the centre / nucleus (1) plum pudding electrons embedded in the (mass) of positive (charge) (1)		
		•	nuclear model the atom mainly empty space (1) plum pudding model is a 'solid' mass (1) <i>to gain credit it must be clear which model is being described</i> <i>do not accept simple descriptions on the diagram without comparison</i>		
	(b)	nucleus must be <u>positive</u> to deflect/ repel alpha particles			1
		<i>answers in terms of electrons/negative charge causing deflection negates mark</i> <i>answers in terms of reflection negates mark</i>			
		nucleus (very) small so few alpha particles deflected backwards			1
		<i>accept most of atom empty space so <u>most</u> pass through</i>			
	(c)	many/ 100 000 measurements taken			1
		<i>accept results for measurements; accept data valid / reliable</i>			
		findings could not be explained by plum pudding model			1
		<i>accept a specific finding that could not be explained</i> <i>eg some alpha particles were deflected backwards</i>			

[8]