

Question number	Answer	Notes	Marks
1 (a)	gallium / Ga		1
(b)	sodium / magnesium / aluminium / Na / Mg / Al		1
(c)	fluorine / F / F ₂		1
(d)	nitrogen / N / N ₂		1
(e)	neon / argon / krypton / xenon / radon / Ne / Ar / Kr / Xe / Rn		1
		Total	5

Question number	Answer	Accept	Reject	Marks
2 (a) (i)	B			1
(ii)	A			1
(iii)	E			1
(iv)	C			1
(b) (i)	Atomic number			1
(ii)	Electrons in the outer shell			1
			Total	6

Question number			Answer	Notes	Marks
3	a	i	C (neutrons and protons)		1
		ii	A (6)		1
		iii	D (11)		1
	b		4		1
	c	i	P AND T		1
		ii	S		1
	d		(one) more electron than protons OR (one) fewer proton than electrons	Accept more electrons than protons Accept fewer protons than electrons Accept 2 electrons and 1 proton Ignore references to electron gained	1
				Total 7 marks	

Question number	Answer	Notes	Marks						
4 a	<table border="1"> <tr> <td>Number of protons</td> <td>6</td> </tr> <tr> <td>Number of neutrons</td> <td>6</td> </tr> <tr> <td>Number of electrons</td> <td>6</td> </tr> </table>	Number of protons	6	Number of neutrons	6	Number of electrons	6	M1 protons and electrons correct M2 neutrons correct	2
Number of protons	6								
Number of neutrons	6								
Number of electrons	6								
b i	3		1						
ii	M1 33 M2 Z is two places/columns/groups/positions after X OR Z is in Group 5 and X is in Group 3	Accept has 2 more protons (than X) Ignore references to atomic number increasing by 2 Ignore number of protons increases with group number Ignore references to elements being arranged according to number of protons $31 + 5 - 3 = 33$ scores 2 marks	2						
iii	2.8 / 2,8 / 2 and 8 separated by other mark eg : or / or) or space	Do not accept 28 (ie no space) Accept correct sp notation	1						

Question number	Answer	Notes	Marks
4 b iv	<p>M1 (similarity) one electron/same number of electrons in outer shell</p> <p>M2 (difference) different number of (electron) shells / T has (one) more (electron) shell / J has (one) less (electron) shell /J has 2 shells and T has 3 /J is 2.1 and T is 2.8.1</p>	<p>Accept rings and energy levels in place of shells in M1 and M2</p> <p>Accept valence electrons in place of outer shell electrons Accept configuration ends in 1 Accept same outer shell Accept 2 electrons in first/inner shell</p> <p>Accept going down the column there is 1 more shell Ignore T has an extra number Ignore T has 8 more electrons</p>	2
		Total 8 marks	

Question number			Answer	Notes	Marks
5	a	i	period	Ignore number of period	1
		ii	Any two of sodium / magnesium / aluminium	Ignore symbols Na, Mg, Al	1
		iii	Ar / argon (it does) not easily gain/lose electrons OR has 8 electrons in outer shell	If name and symbol both given, then both must be correct Accept (it has) a full outer shell Ignore 2.8.8 Ignore inert/noble gas Ignore references to Group number Ignore stable M2 DEP on M1	2
	b		one electron/same number of electrons AND reference to outer/valence (shell/energy level/orbit)	Reject incorrect number of electrons Ignore similar electronic configurations Ignore actual electronic configurations	1
	c	i	C / carbon		1
		ii	S / sulfur		1
	d		8 for both protons AND electrons 10 neutrons	Accept words Accept words	1 1

(Total for Question 5 = 9 marks)

Question number		Answer	Notes	Marks
3	(d)	<p>M1 (step 1) dip a platinum wire into some concentrated hydrochloric acid</p> <p>M2 (step 3) place the wire and sample into non-luminous Bunsen flame</p>	<p>Accept complete statements or changes</p> <p>M1 Do not penalise references to dilute instead of concentrated Accept hydrochloric acid / HCl</p> <p>M2 Accept blue flame / roaring flame Ignore references to hot / hotter / hottest flame</p>	2
	(e)	B (lilac)		1
			Total for Question 6	10