ATOMIC STRUCTURE 1

MARK SCHEME

Q1.

Question	Answer	Extra information	Marks
(a)	118		1
(b)	it loses / transfers electrons three electrons	it = Au / gold atom sharing / covalency = max 1 mark	2
Total marks			3

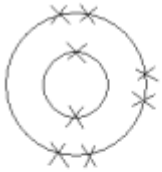
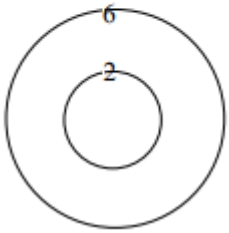
Q2.

Question	Answer	Extra information	Marks
(i)	gain electron(s) one electron	accept fully balanced correct equation for 2 marks if no other marks awarded allow (potassium ions) reduced for 1 mark	1 1
(ii)	2,8,8	accept any combination of dots, crosses, "e" or any other relevant symbol ignore any charges if given	1
Total marks			3

Q3.

Question	Answer	Extra information	Marks
	any three from: • same number of protons • ^{2}H has one neutron • ^{1}H has no neutrons • same number of electrons	accept same atomic number numbers if given must be correct accept different mass number or different number of neutrons for 1 mark ignore relative atomic mass numbers if given must be correct	3
Total marks			3

Q4.

Question	Answer	Extra information	Marks
(a)(i)	 **or** 	allow any arrangement of electrons on the shells accept o, x, - or e as representing electrons	1
(ii)	nucleus	accept nucleus (protons plus neutrons) do not accept protons plus neutrons on its own allow nuclei / nucles / neucleus / phonetic spelling do not accept neutron	1
(b)	it has 2 more neutrons or converse or O-16 has 8 neutrons (1 mark) O-18 has 10 neutrons (1 mark)	accept 'it has more neutrons' or 'different number of neutrons' for 1 mark '2 more protons / electrons + correct number of neutrons' = max 1 mark if incorrectly calculated but shows more neutrons in 0-18 allow for 1 mark accept it has more particles or it has 2 more particles for 1 mark ignore any reference to charges just 2 more without reference to particles = 0 marks	2
Total marks			4

Q5.

Question	Answer	Extra information	Marks
(a)	$^{2}H_{1}$	2 and 1 must be on the left 2 must be above half-way on the H and the 1 below half-way accept diagram with 2 different particles in centre and 1 particle on circle	1
(b)	18	ignore working ignore units	1
Total marks			2

Q6.

Question	Answer	Extra information	Marks
(i)	• it loses electrons • three electrons	sharing / covalency = max 1 mark	1 1
(ii)	8 electrons shown in second shell	accept dots / crosses / mixture of dots and crosses / e electrons do not need to be paired do **not** allow extra electrons in first shell	1
Total marks			3

Q7.

Question	Answer	Extra information	Marks
	an electron is gained owtte	allow electrons allow electron shared / lost for 1 mark apply list principle for additional particles must be linked to electron accept can hold / take in if in correct context e.g. it can hold another electron (in its outer shell) = 2 marks	1 1

		it can take an electron (from another atom) = 2 marks ignore reference to fluoride ions incorrect number of electrons gained does not gain the second mark	
Total marks			2

Q8.

Question	Answer	Extra information	Marks
	2.8.3 on diagram as Xs / dots or e	accept paired or unpaired	1
Total marks			1

Q9.

Question	Answer	Extra information	Marks
(a)	proton 1 electron very small owtte	ignore ± allow zero allow values from 1/1800 to 1/2000 or 0.0005 – 0.00055	1 1
(b)	8 16		1 1
(c)(i)	Isotopes		1
(ii)	$^{18}_{8}O$		1
(d)	compound		1
Total marks			7

Q10.

Question	Answer	Extra information	Marks
(i)	protons		1
(ii)	neutrons		1
(iii)	7		1
Total marks			3

Q11.

Question	Answer	Extra information	Marks
(a)	4		1
(b)	9		1
Total marks			2

Q12.

Question	Answer	Extra information	Marks
(i)	B		1
(ii)	a lithium atom loses an electron		1
(iii)	C		1
Total marks			3

Q13.

Question	Answer	Extra information	Marks
(i)	6		1
(ii)	12		1
(iii)	$^{14}_{6}C$		1
Total marks			3

Q14.

Question	Answer	Extra information	Marks
(i)	14		1
(ii)	isotope		1
(iii)	(very) small	accept smaller / tiny / (very) little	1
Total marks			3