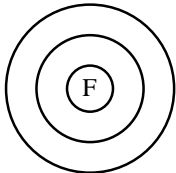
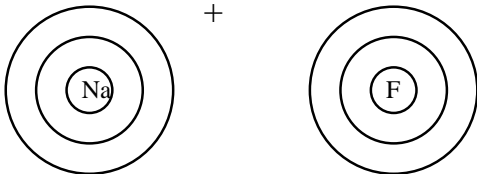


Structure and bonding

1. (i) B or 2, 8, 1 for one mark 1  
 (ii) A or 2, 8 for one mark 1 [2]
2. (a) C<sub>16</sub> H<sub>34</sub> for one mark 1  
 (b) electron gains one mark 2  
 but shared electrons gains 2 marks [3]
3. (a) all electrons correct (inner shell need not be shown)  
 three bond pairs and two electrons anywhere else  
 can use dots, crosses or e's in any combination 1  
 (b) covalent accept phonetic spelling; do **not** accept convalent 1 [2]
4. (a) 2, 8, 8, 1 for 1 mark 1  
 (b) (i)  4  
 for 1 mark  
 Ignore symbol in middle but structure must be drawn NOT 2,7  
 (ii)  (1) for charges  
 (1) for each structure  
 If covalent; can score mark for changes but not for diagram  
 Arrow showing electron transfer from metal atom to non-metal atom = 2 marks  
 If the ions are not identified then cannot score mark for changes [5]
5. (a) any (must be named) 1  
 (b) F<sub>2</sub> 1  
 (c) -/F<sup>-</sup> 1  
 (d) (i) covalent 1  
 (ii) made of molecules etc. type of bonding when non-metals react. 1 [5]
6. (a) (i) rings of 2, 8 and 3 electrons  
 credit 2, 8, 3 pay particular attention to the outer shell in diagrams 1

	(ii) rings of 2, 8 and 7 electrons	1	
	<i>credit 2, 8, 7 pay particular attention to the outer shell in diagrams</i>		
(b)	(i) <i>labels not required on atoms</i>		
	<i>charges need to be shown on ions</i>		
	<i>reference to outer shell is required otherwise a maximum of two marks</i>		
	<i>structure of atoms/ions marks</i>		
	(ring of 2, 8, 1 for sodium) <b>or</b> the outer shell of sodium only contains 1 electron	1	
	<i>credit 2, 8, 1 or an ion 2, 8 or two circles and 1 electron in outer shell</i>		
	(ring of 2, 6 for oxygen) <b>or</b> outer shell only contains 6 electrons	1	
	<i>credit 2, 6 or an ion 2, 8 or two circles</i>		
	<i>transfer of electrons mark</i>		
	two sodiums needed to supply two outer electrons to oxygen to complete the (one oxygen's) outer shell	1	
	<i>award maximum of two marks if a covalent structure is given</i>		
	<i>credit two rings of electrons for sodium showing outer electrons</i>		
	<i>transferring to outer shell of one oxygen for three marks</i>		
	<i>do not accept diagrams showing overlapping rings for third mark</i>		
	(ii) loses an electron	1	
	<i>credit atoms lose electrons or oxygen takes the electron ignore oil rig</i>		
			[6]
7.	(a) X – (metal) atom / ion	1	
	Y – electron	1	
	(b) free electrons or electrons move	1	
	(allow metal) atoms / ions to slide over each other	1	
	<b>OR</b> bonding non - directional for 2 marks		
			[4]
8.	answers apply to: ( <i>accept diagrams and/or descriptions</i> )		
	• carbon dioxide CO <sub>2</sub>		
	• ammonia NH <sub>3</sub>		
	• methane CH <sub>4</sub>		
	• water H <sub>2</sub> O		
	*outer electronic structure of one atom correct		
	<b>or</b> needs correct number of electrons to complete outer shell	1	
	*outer electronic structure of other atom correct		
	<b>or</b> needs correct number of electrons to complete outer shell	1	
	*one shared <b>pair</b> of electrons (as one covalent bond)	1	
	<i>use of ions or reference to ionic bonding negates this mark</i>		
	*outer electronic structure of compound correct <b>or</b> each atom now has a full outer shell/noble gas electron structure	1	
			[4]