Question 1

1(b)(iii)	bonding pair of electrons between iodine atoms (1) 6 non-bonding electrons on each iodine atom (1)	**2**

Question 2

2(a)	pair of electrons between each H and N and no other electrons on H atoms (1) two non-bonding electrons on N atom (1)	**2**

Question 3

3(a)	1 mark each for any 2 of: • poor thermal conductor / poor conductor of heat • not malleable / brittle • not ductile • low melting point / low boiling point	**2**

3(c)(i)	**pair** of electrons (1) (electron(s) shared) between **two** atoms (1)	**2**
3(c)(ii)	3 dot-and-cross bonding pairs between each H and N and no extra electrons on H (1) Two non-bonding electrons on N (1)	**2**

Question 4

4(a)	diamond does not conduct	**1**
	sulfur does not conduct	**1**
4(b)	low boiling point	**1**

Question 5

5(b)(iii)	pair of electrons in overlap area between the atoms	**1**
	six unbonded electrons on each C*l* atom in the molecule	**1**

Question 6

6(b)	2 electrons in each of the four overlap areas AND no unpaired electrons on the hydrogen atoms	**1**

Question 7

7(d)(i)	**M1 pair** of electrons **M2** electron(s) shared between **two** atoms	**2**

Question 8

8(h)	**M1** two dot-**and**-cross double bonds **M2** two pairs of non-bonding electrons on O **and** zero non-bonding electrons on C	**2**

Question 9

9(b)	**M1** both bonds with 2 dots and 2 crosses(1) **M2** 2 lone pairs (all dots or all crosses) on both oxygen atoms completing all 3 octets(1)	**2**

9(c)(ii)	intermolecular forces	**1**

Question 10

10(c)	C atom double bonded to 2 O atoms 4 non-bonding e^- on each O and no non-bonding e^- on C and both octets complete	**2**

Question 11

11(b)(i)	2 bonding pairs as **one dot and cross** each (1) 2 lone pairs on S (and no additional electrons on Hs) to complete the outer shell on S and both Hs (1)	**2**
11(b)(ii)	**2**H_2S + SO_2 → **3**S + **2**H_2O	**1**

Question 12

12(b)	**M1** all single bonding dot and cross pairs correct (1) **M2** double C=O bond dot and cross pairs are correct (1) **M3** complete diagram is correct (1)	**3**