Paper 1

Questions are applicable for both core and extended candidates

1 Which molecule has only two shared pairs of electrons?

A CH_4 **B** Cl_2 **C** HCl **D** H_2O

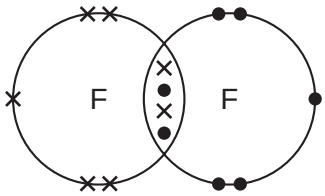
2 Which row describes the formation of single covalent bonds in methane?

A	atoms share a pair of electrons	both atoms gain a noble gas electronic structure
B	atoms share a pair of electrons	both atoms have the same number of electrons in their outer shell
C	electrons are transferred from one atom to another	both atoms gain a noble gas electronic structure
D	electrons are transferred from one atom to another	both atoms have the same number of electrons in their outer shell

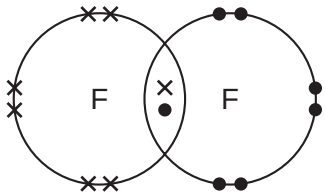
3 Fluorine, F_2, is in the same group of the Periodic Table as chlorine, Cl_2.

Which diagram represents the arrangement of the outer-shell electrons in a molecule of fluorine?

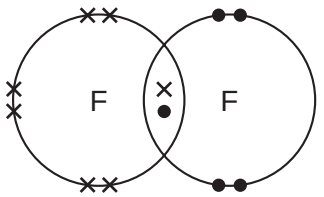
A



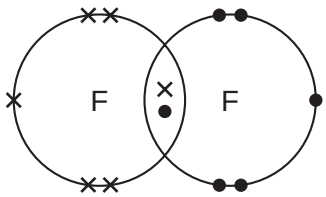
B



C



D



4 A covalent molecule M contains a total of four shared electrons.

What is M?

A ammonia, NH_3

B hydrogen chloride, HCl

C methane, CH_4

D water, H_2O

Paper 2

Questions are applicable for both core and extended candidates unless indicated in the question

5 Methanal, CH_2O, has a boiling point of –19 °C.

At –20 °C, the liquid methanal is a non-conductor of electricity.

In a sample of methanal, each atom of carbon, hydrogen and oxygen has noble gas electronic configuration. Each atom has achieved this electronic configuration in one of three ways:

- gaining electrons
- losing electrons
- sharing electrons.

Which statement describes the bonding between the carbon atom and the oxygen atom in methanal?

(extended only)

A The carbon atom and the oxygen atom share four electrons.

B The carbon atom and the oxygen atom share two electrons.

C Carbon is a negative ion and oxygen is a positive ion. These two ions attract each other.

D Carbon is a positive ion and oxygen is a negative ion. These two ions attract each other.

6 Which row describes the formation of single covalent bonds in methane?

A	atoms share a pair of electrons	both atoms gain a noble gas electronic structure
B	atoms share a pair of electrons	both atoms have the same number of electrons in their outer shell
C	electrons are transferred from one atom to another	both atoms gain a noble gas electronic structure
D	electrons are transferred from one atom to another	both atoms have the same number of electrons in their outer shell

7 Which diagram represents the outer-shell electron arrangement in a nitrogen molecule?

(extended only)

A

B

C

D

8 Lithium chloride is an ionic compound and silicon(IV) oxide is a covalent compound.

Which statement about **both** compounds is correct?

A They are not soluble in water.

B They conduct electricity when melted.

C They do not conduct electricity in solid form.

D They have low melting points.