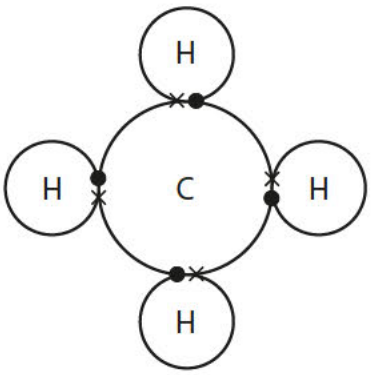
1 Many substances exist as molecules.

(a) The diagram shows the outer shell electrons in a molecule of methane, CH_4.



(i) Each hydrogen atom is bonded to the carbon atom by a covalent bond.

Give the meaning of the term **covalent bond**.

(1)

.....

.....

.....

(ii) Complete the sentence by putting a cross (☒) in the box next to your answer.

Methane is a typical simple molecular, covalent compound.

A property of methane is that

(1)

☐ **A** it has a high melting point

☐ **B** it is a good conductor of electricity

☐ **C** there are weak bonds in its molecule

☐ **D** it has a low boiling point

(b) Nitrogen and oxygen are gases in air.

Describe how samples of nitrogen and oxygen can be obtained from air.

(3)

*(c) Graphite is a form of the element carbon.
Graphite is a giant molecular, covalent substance.

Use the structure and bonding in graphite to explain why it is able to be used as a lubricant and as a conductor of electricity.

(6)

(d) Give a use of graphite that depends on its ability to conduct electricity.

(1)

(Total for Question 1 = 12 marks)