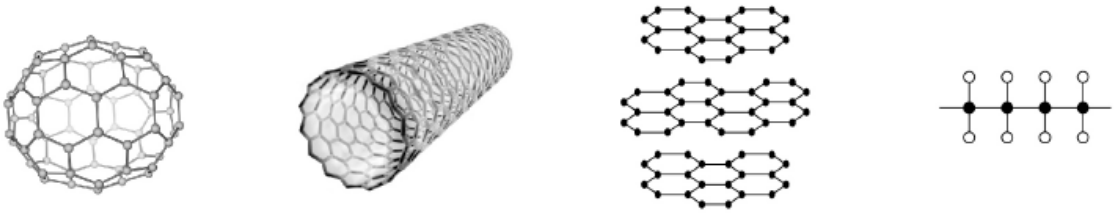
AQA – Chemical bonds, ionic, covalent and metallic – GCSE 2022 Chemistry

1. June/2022/Paper_8462/1F/No.6

0 6 This question is about carbon and compounds of carbon.

Figure 9 shows diagrams that represent different structures.

Figure 9



A **B** **C** **D**

Use **Figure 9** to answer questions **06.1** and **06.2**.

0 6 . 1 Which diagram represents graphite?

[1 mark]

Tick (✓) **one** box.

A ☐ **B** ☐ **C** ☐ **D** ☐

0 6 . 2 Which diagram represents poly(ethene)?

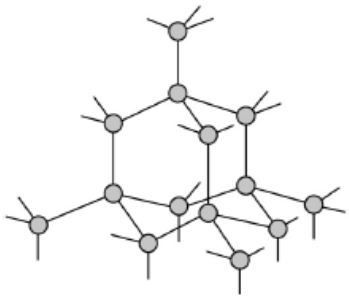
[1 mark]

Tick (✓) **one** box.

A ☐ **B** ☐ **C** ☐ **D** ☐

Figure 10 represents the structure of diamond.

Figure 10



Key

Carbon atom

0 6 . 3 How many covalent bonds does each carbon atom form in diamond?

[1 mark]

_____

0 6 . 4 Which is a property of diamond?

[1 mark]

Tick (✓) **one** box.

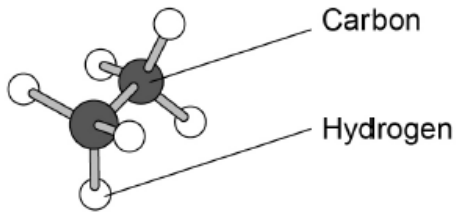
Conducts electricity ☐

Low melting point ☐

Very hard ☐

0 6 . 5 **Figure 11** shows a model of a molecule.

Figure 11



Complete the molecular formula of the molecule.

[1 mark]

Molecular formula = C__ H__

Carbonic acid is a compound of carbon.

The formula of carbonic acid is H_2CO_3

0 6 . 6 Which ion is produced by carbonic acid in aqueous solution?

[1 mark]

Tick (✓) **one** box.

H^+ ☐ OH^- ☐ O^{2-} ☐

0 6 . 7 Calculate the relative formula mass (M_r) of carbonic acid (H_2CO_3).

Relative atomic masses (A_r): H = 1 C = 12 O = 16

[2 marks]

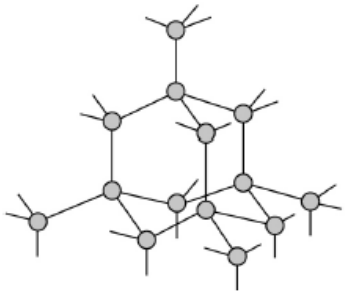
Relative formula mass (M_r) = _____

2. June/2022/Paper_8462/1H/No.3

0 3 This question is about different forms of carbon.

Figure 5 represents the structure of diamond.

Figure 5



Key

○ Carbon atom

0 3 . 1 Describe the structure and bonding of diamond.

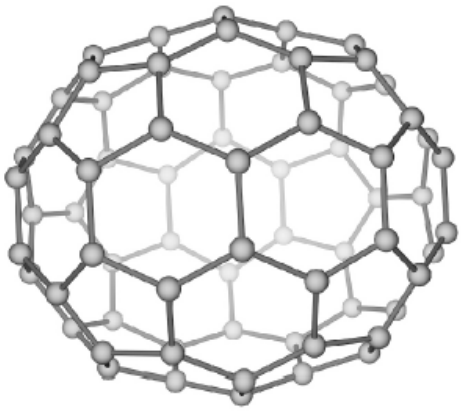
[3 marks]

0 3 . 2 Explain why diamond has a very high melting point.

[3 marks]

Figure 6 represents the molecule C_{70}

Figure 6



0 3 . 3 What is the name of this type of molecule?

[1 mark]

Tick (✓) **one** box.

Fullerene ☐

Graphene ☐

Nanotube ☐

Polymer ☐

0 3 . 4 Molecules such as C_{70} can be used in medicine to move drugs around the body.

Suggest **one** reason why the C_{70} molecule is suitable for this use.

[1 mark]

_____

_____

0 3 . 5 Calculate the number of C_{70} molecules that can be made from one mole of carbon atoms.

The Avogadro constant = 6.02×10^{23} per mole

[3 marks]

Number of molecules = _____