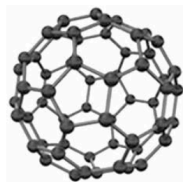


Structure and bonding in carbon

Q1. (2018)

0 1 . 3 Figure 3 shows the structure of C_{60}

Figure 3



Complete the sentence.

Choose the answer from the box.

[1 mark]

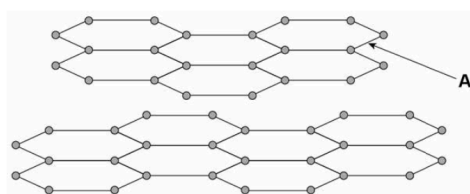
diatomic	giant ionic	a fullerene	giant metallic
----------	-------------	-------------	----------------

The structure of C_{60} is _____.

Q2. (2018)

Figure 4 shows the structure of graphite.

Figure 4



0 1 . 4 What type of bond is labelled A in Figure 4?

[1 mark]

Tick **one** box.

covalent

☐

double

☐

ionic

☐

metallic

☐

Q3. (2020)

A)

Diamond has a giant covalent structure.

0 7 . 4 What is the number of bonds formed by each carbon atom in diamond?

[1 mark]

Tick (✓) **one** box.

2	☐	3	☐	4	☐	8	☐
---	--------------------------	---	--------------------------	---	--------------------------	---	--------------------------

B)

0 7 . 5

Give **two** physical properties of diamond.

[2 marks]

1 _____

2 _____

C)

0 7 . 6

Name **two** other substances with giant covalent structures.

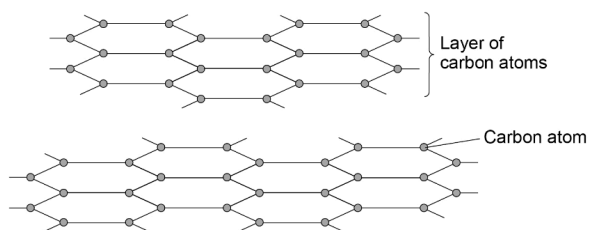
[2 marks]

1 _____

2 _____

Q4. (2021)

In graphite the carbon atoms are held together by bonds.

Figure 4 represents part of the structure of graphite.**Figure 4**

0 3 . 3

How many bonds does each carbon atom have in graphite?

Use **Figure 4**.

[1 mark]

Tick (✓) **one** box.1 ☐ 2 ☐ 3 ☐ 4 ☐

Q5. (2021)

0 3 . 4

What type of bonds hold the carbon atoms together in graphite?

[1 mark]

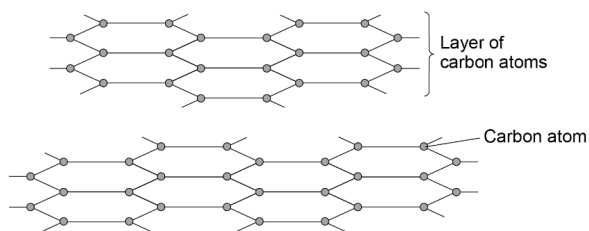
Tick (✓) **one** box.Covalent ☐Ionic ☐Metallic ☐

Q6. (2021)

In graphite the carbon atoms are held together by bonds.

Figure 4 represents part of the structure of graphite.

Figure 4



0 3 . 5 Lubricants allow objects to slide over each other easily.

Suggest why graphite can be used as a lubricant.

Use Figure 4.

[1 mark]

Q7. (2021)

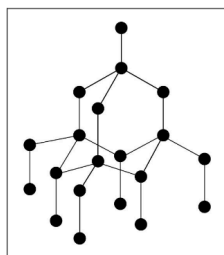
0 3 . 6 The two structures represent different forms of carbon.

Draw **one** line from each structure to the form of carbon.

[2 marks]

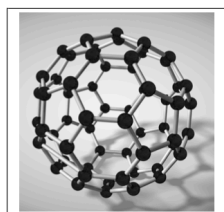
Structure

Form of carbon



Buckminsterfullerene

Diamond



Graphene

Nanotube

Q8. (2022)

0 3 . 1 What type of structure is silicon dioxide?

[1 mark]

Tick (✓) **one** box.

Giant covalent

☐

Ionic lattice

☐

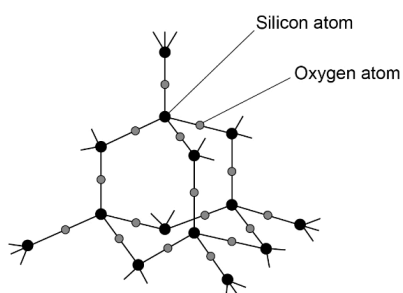
Simple molecular

☐

Q9. (2022)

03

This question is about structure and bonding.

Figure 6 represents part of the structure of silicon dioxide.**Figure 6**

03.2

Each oxygen atom forms two bonds.

What is the number of bonds formed by each silicon atom?

Use **Figure 6**.

[1 mark]

Q10. (2022)

03.3

Complete the sentence.

Choose the answer from the box.

[1 mark]

hexagons

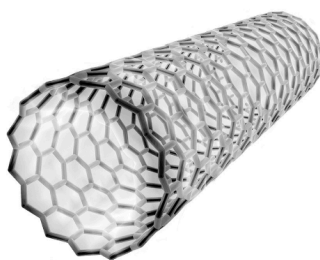
octagons

squares

triangles

The structure of fullerenes is based on _____.

Q11. (2022)

Figure 7 represents part of a fullerene.**Figure 7**

A)

03.4

Complete the sentence.

Choose the answer from the box.

[1 mark]

carbon

hydrogen

oxygen

The fullerene molecule shown in **Figure 7** is made from atoms of _____.

B)

0 3 . 5 What is the fullerene molecule shown in **Figure 7** used for?

[1 mark]

Tick (✓) **one** box.

Electronics

☐

Hand warmers

☐

Sports injury packs

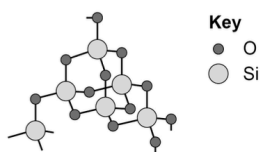
☐

Q12. (2023)

0 3 . 5 Silica has a giant covalent structure.

Figure 8 represents the structure of silica.

Figure 8



Determine the ratio of silicon (Si) atoms to oxygen (O) atoms in silica.

Use **Figure 8**.

[1 mark]

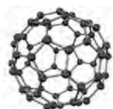
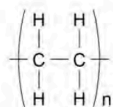
_____ Si : _____ O

Q13. (2024)

0 2 . 2 Which diagram represents the structure of diamond?

[1 mark]

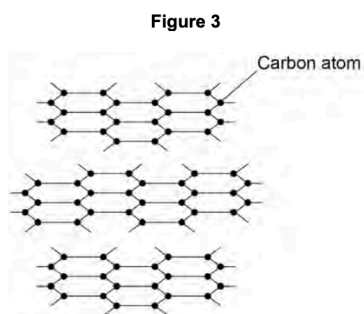
Tick (✓) **one** box.


☐

☐

☐

Q14. (2024)

Figure 3 represents part of the structure of graphite.



0 2 . 3 In graphite each carbon atom forms covalent bonds.

How many covalent bonds does each carbon atom form in graphite?

[1 mark]

Tick (✓) **one** box.

1	☐	2	☐	3	☐	4	☐
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Q15. (2024)

0 2 . 4 Graphite conducts electricity.

Which particles carry electrical charge through graphite?

[1 mark]

Q16. (2024)

0 2 . 5 Where are fullerenes used?

Tick (✓) **one** box.

[1 mark]

In electronic components

☐

In self-heating cans

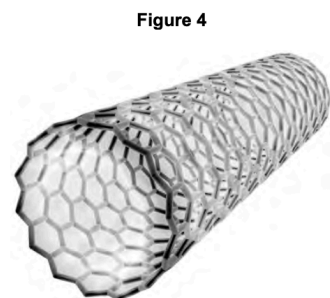
☐

In sports injury packs

☐

Q17. (2024)

Figure 4 represents the structure of a fullerene.



0 2 . 6 Describe the structure of the fullerene shown in Figure 4.

[2 marks]

Q18. (2024)

0 8

Table 8 shows diagrams which represent the structures of two substances.

Table 8

Substance	Structure
Sodium chloride NaCl	
Oxygen O ₂	

Compare the structure and bonding of sodium chloride and oxygen.

[6 marks]