

3 The table shows information about four different particles.

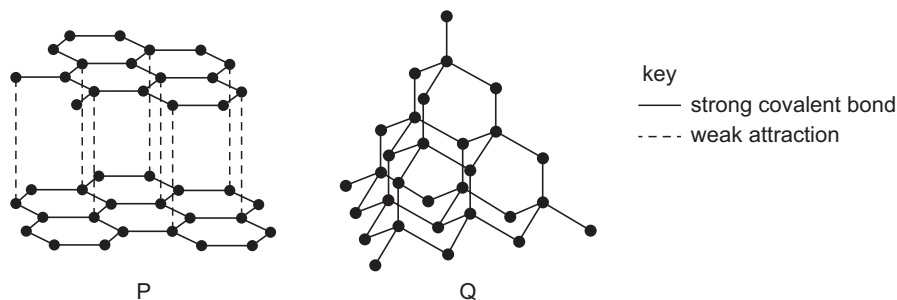
particle	nucleon number	number of protons	number of neutrons	number of electrons
Na	23	11	W	11
Na ⁺	23	11	12	X
O	16	8	Y	8
O ²⁻	16	8	8	Z

What are the values of W, X, Y and Z?

	W	X	Y	Z
A	11	10	10	8
B	11	11	8	10
C	12	10	8	10
D	12	11	10	8

4 Substances with giant covalent structures can be used as lubricants and as cutting tools for hard materials.

The diagrams show how the atoms are arranged in two giant covalent substances, P and Q.



Which statement is correct?

- A Only P is used as a cutting tool and only Q is used as a lubricant.
- B Only P is used as a lubricant and only Q is used as a cutting tool.
- C P and Q are both used as cutting tools.
- D P and Q are both used as lubricants.

5 Symbols representing four particles are shown.



The letters are **not** the chemical symbols.

Which particles have the same number of neutrons?

- A W and X²⁺
- B W and Z
- C X²⁺ and Y
- D Y and Z

6 Which statement describes the formation of bonds in lithium bromide?

- A A lithium atom donates one electron to a bromine atom.
- B A bromine atom donates one electron to a lithium atom.
- C A lithium atom shares a pair of electrons with a bromine atom.
- D A bromine atom donates a pair of electrons to a lithium atom.

7 Which statement explains why solid magnesium is a good conductor of electricity?

- A Magnesium has delocalised electrons that can move through the lattice.
- B Magnesium has strong attractions between ions.
- C Magnesium consists of a giant lattice of anions in a 'sea' of delocalised electrons.
- D Magnesium consists of metal ions that move through the lattice.

4 Which row describes elements, compounds and mixtures?

	elements	compounds	mixtures
A	all the atoms are the same type	contain different atoms chemically joined together	can be separated using physical processes
B	all the atoms are the same type	can be separated into new substances using chemical processes	contain different atoms chemically joined together
C	can be separated into new substances using chemical processes	all the atoms are the same type	contain different atoms chemically joined together
D	contain different atoms chemically joined together	all the atoms are the same type	can be separated using physical processes

5 Which statement about atoms or ions is correct?

- A The mass number of an atom is the total number of nucleons and protons.
- B The electronic configuration of an aluminium ion, Al^{3+} , is 2,8,3.
- C Hydrogen is the only atom that has an incomplete first electron shell.
- D Most of the volume of an atom is taken up by its nucleus.

6 Which two values are used to calculate the relative atomic mass of a sample of boron?

	value 1	value 2
A	the total number of boron isotopes	the total number of boron atoms
B	the relative abundance of each boron isotope in the sample	the relative mass of each boron isotope
C	the relative abundance of each boron isotope in the sample	the total number of boron atoms
D	the total number of boron isotopes	the relative mass of each boron isotope

7 Which statement describes the structure of sodium chloride?

- A a lattice of alternating positive and negative ions
- B a lattice of positive ions surrounded by a 'sea' of delocalised electrons
- C a mixture of sodium and chlorine atoms
- D a regular lattice of sodium and chlorine atoms

8 Graphite and diamond are both forms of the element carbon.

Which row shows the number of other carbon atoms that each carbon atom is covalently bonded to in graphite and in diamond?

	graphite	diamond
A	3	3
B	3	4
C	4	3
D	4	4