

- 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

- 6 A sample of copper has a relative atomic mass of 63.5.

What are the relative abundances of the isotopes in this sample of copper?

- A** 25% ^{63}Cu and 75% ^{65}Cu
B 50% ^{63}Cu and 50% ^{65}Cu
C 75% ^{63}Cu and 25% ^{65}Cu
D 90% ^{63}Cu and 10% ^{65}Cu

- 5 A sample of element Q has two isotopes.

Their relative masses and abundances are shown.

relative mass of isotope	abundance / %
238	66
244	34

What is the relative atomic mass of this sample of Q to three significant figures?

- A** 240 **B** 241 **C** 242 **D** 243

2 Atoms are made of electrons, neutrons and protons.

(a) State which of these particles are found in the nucleus of an atom.

..... [1]

(b) Atoms of the same element are known as isotopes.

$^{32}_{16}\text{S}$ and $^{34}_{16}\text{S}$ are isotopes of sulfur.

(i) Complete Table 2.1 to show the number of electrons, neutrons and protons in one atom or ion of these isotopes.

Table 2.1

isotope	electrons	neutrons	protons
$^{34}_{16}\text{S}$			
$^{32}_{16}\text{S}^{2-}$			

[3]

(ii) Table 2.2 shows the relative masses and the percentage abundances of the two isotopes in a sample of sulfur.

Table 2.2

relative mass of isotope	percentage abundance of isotope
32	95
34	5

Calculate the relative atomic mass of this sample of sulfur to **one** decimal place.

relative atomic mass = [2]

(iii) The relative atomic masses of all elements are compared to one atom of an isotope.

Identify this isotope.

..... [1]

(c) Ions are atoms or groups of atoms that have gained or lost one or more electrons.

An oxygen atom has the electronic configuration of 2,6.

Give the formula of **one** atom and **one** positive ion that has the same electronic configuration as O^{2-} .

- atom
- positive ion

[2]

[Total: 9]

5 Element T has two isotopes, ${}^{12}_6T$ and ${}^{14}_6T$.

Which statement about these isotopes is correct?

- A They have different chemical properties because they have different numbers of neutrons.
- B They have the same chemical properties because they have the same number of outer shell electrons.
- C They have the same nucleon number because the sum of the number of protons and electrons is the same.
- D They have different positions in the Periodic Table because they have different numbers of neutrons.

6 Lithium is in Group I of the Periodic Table. Nitrogen is in Group V of the Periodic Table.

Lithium reacts with nitrogen to form the ionic compound lithium nitride, Li_3N .

What happens to the electrons when lithium atoms and nitrogen atoms form ions?

	lithium	nitrogen
A	each lithium atom loses one electron to form an Li^+ ion	each nitrogen atom gains three electrons to form an N^{3-} ion
B	each lithium atom loses one electron to form an Li^+ ion	each nitrogen atom gains five electrons to form an N^{5-} ion
C	each lithium atom gains one electron to form an Li^- ion	each nitrogen atom loses three electrons to form an N^{3+} ion
D	each lithium atom gains one electron to form an Li^- ion	each nitrogen atom loses five electrons to form an N^{5+} ion