



IGCSE CHEMISTRY

0620

ATOMIC STRUCTURE

TOPICAL PAST PAER (MCQ)

2026 EDITION

Q1 An atom of element Q contains 19 electrons, 19 protons and 20 neutrons.

0620/11/M/J/25/Q3

What is Q?

- A** calcium
- B** potassium
- C** strontium
- D** yttrium

Q2 Which part of an atom has a relative mass of 1 and a relative charge of 0?

0620/11/M/J/25/Q4

- A** electron
- B** neutron
- C** nucleus
- D** proton

Q3 Which row identifies the number of electrons, neutrons and protons in a particle which is an isotope of $^{11}_5\text{B}$?

0620/11/M/J/25/Q5

	electrons	neutrons	protons
A	5	5	5
B	5	6	5
C	6	5	6
D	6	6	6

Q4 An atom of the element erbium is represented by $^{167}_{68}\text{Er}$.

0620/13/M/J/25 Q4

Which row shows the number of protons, neutrons and electrons in this atom?

	protons	neutrons	electrons
A	68	99	68
B	68	99	99
C	99	68	68
D	99	68	99

- Q5** Which row gives the number of protons, electrons and neutrons in an atom of zinc?

0620/22/M/J/25/Q3

	protons	electrons	neutrons
A	30	30	35
B	30	35	35
C	35	30	30
D	35	35	30

- Q6** Which atom has an equal number of protons, neutrons and electrons? 0620/21/M/J/25/Q3

A ^{40}Ar **B** ^1H **C** ^{23}Na **D** ^{14}N

- Q7** Symbols representing four particles are shown.

0620/21/O/N/25/Q5



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

Which particles have the same number of neutrons?

A W and X^{2+} **B** W and Z **C** X^{2+} and Y **D** Y and Z

- Q8** What is the nucleon number of an atom?

0620/23/M/J/25/Q4

- A** the number of electrons, neutrons and protons in the nucleus
B the number of neutrons and protons in the nucleus
C the number of neutrons in the nucleus
D the number of protons in the nucleus

- Q9** Which atom has twice as many neutrons as protons?

0620/23/M/J/25/Q3

A ^1_1H **B** ^2_1H **C** ^3_1H **D** ^4_2He

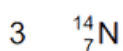
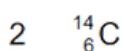
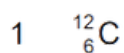
Q10 Which statement defines nucleon number?

0620/23/O/N/25/Q3

- A** It is the total number of protons in the nucleus of an atom.
- B** It is the total number of electrons surrounding the nucleus of an atom.
- C** It is the total number of neutrons in the nucleus of an atom.
- D** It is the total number of protons and neutrons in the nucleus of an atom

Q11 The symbols of four atoms are listed.

0620/23/O/N/25/Q4



Which atoms have more neutrons than protons?

- A** 1 and 2 **B** 2 and 3 **C** 2 and 4 **D** 3 and 4

Q12 Which statements about isotopes are correct?

0620/22/M/J/24

- 1 Isotopes are atoms of different elements with the same number of protons.
- 2 Isotopes of the same element have the same chemical properties.
- 3 Isotopes are atoms with the same relative atomic mass.
- 4 Isotopes of the same element have the same electronic configuration.

- A** 1 and 2 **B** 1 and 3 **C** 2 and 4 **D** 3 and 4

Q13 Rubidium has two isotopes, ${}^{85}_{37}\text{Rb}$ and ${}^{87}_{37}\text{Rb}$.

0620/22/O/N/24/Q3

Which statement explains why both isotopes have the same chemical properties?

- A** They have the same number of protons.
- B** They have the same electronic configuration.
- C** They have different numbers of neutrons.
- D** They have different mass numbers.

Q14 Four statements about atoms are listed.

0620/21/M/J/24/Q4

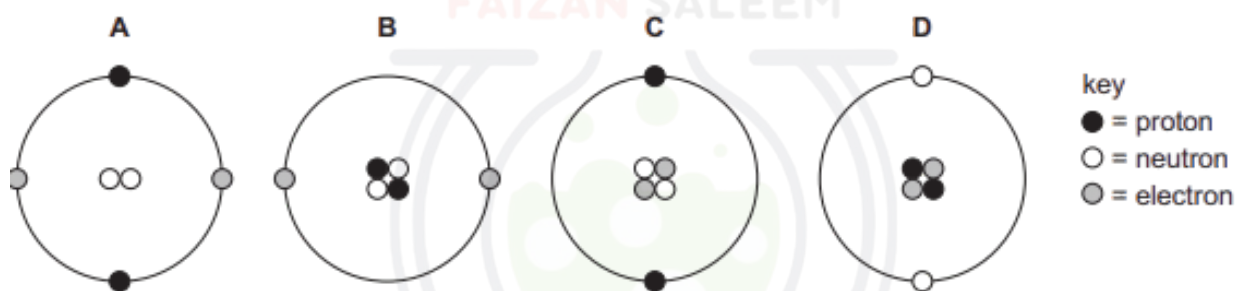
- 1 The centre of an atom is positively charged.
- 2 Protons and electrons are located in the nucleus.
- 3 Protons and electrons have the same mass.
- 4 Most of the mass of an atom is in the nucleus.

Which statements are correct?

- A** 1 and 2 **B** 1 and 4 **C** 2 and 3 **D** 3 and 4

Q15 Which diagram represents one helium atom?

0620/21/O/N/24/Q3



Q16 An atom of element R contains 15 protons, 16 neutrons and 15 electrons.

0620/23/M/J/24/Q4

What is R?

- A** gallium
B phosphorus
C sulfur
D zinc

Q17 Which statement explains why isotopes of the same element have the same chemical properties?

0620/21/M/J/23/Q4

- A** They have the same number of outer shell electrons.
B They have the same number of neutrons.
C They have different numbers of protons.
D They have different mass numbers.

- Q18** The numbers of protons and neutrons and the electronic structures of four particles, W, X, Y and Z, are shown.

0620/21/M/J/22/Q3

	number of protons	number of neutrons	electronic structure
W	8	8	2,8
X	8	10	2,6
Y	8	8	2,6
Z	10	8	2,8

Which particles have the same chemical properties?

- A** W and Y **B** W and Z **C** X and Y **D** X and Z

- Q19** Which statements about isotopes of the same element are correct?

0620/21/O/N/22/Q4

- 1 They are atoms which have the same chemical properties because they have the same number of electrons in their outer shell.
- 2 They are atoms which have the same number of electrons and neutrons but different numbers of protons.
- 3 They are atoms which have the same number of electrons and protons but different numbers of neutrons.

- A** 1 and 2 **B** 1 and 3 **C** 2 only **D** 3 only

- Q20** Which two particles have the same electronic structure?

0620/23/O/N/22/Q4

- A** C and O^{2-}
B F^{-} and Na
C K^{+} and S^{2-}
D Mg and Na^{+}

Q1 The atomic number and nucleon number of a potassium atom are shown.

0620/11/O/N/25/Q2

atomic number	19
nucleon number	39

How many protons, neutrons and electrons are in the potassium ion, K^+ , which is formed from this potassium atom?

	protons	neutrons	electrons
A	19	20	18
B	19	20	20
C	20	19	18
D	20	19	19

Q2 Magnesium is in Group II and Period 3 of the Periodic Table.

0620/11/O/N/25/Q3

Which row shows the charge on a magnesium ion and the electronic configuration of a magnesium ion?

	charge	electronic configuration
A	+2	2,8
B	+2	2,8,2
C	-2	2,8
D	-2	2,8,2

Q3 Which statement about elements and their atoms is correct?

0620/13/M/J/25/Q3

- A** Aluminium is in the second period of the Periodic Table and has two occupied electron shells.
- B** Helium is in Group VIII of the Periodic Table and has eight outer shell electrons.
- C** Lithium is in Group I of the Periodic Table and has one occupied electron shell.
- D** Sulfur is in the third period of the Periodic Table and has six outer shell electrons.

- Q4** The table shows the nucleon number and the number of neutrons in one atom of isotopes W, X, Y and Z.

0620/13/O/N/25 /Q6

isotope	nucleon number	number of neutrons
W	35	18
X	37	20
Y	39	20
Z	40	22

Which statement about W, X, Y and Z is correct?

- A** W and X are isotopes of the same element.
B X and Y are isotopes of elements in the same group of the Periodic Table.
C Y and Z are isotopes of elements in the same period of the Periodic Table.
D Z has a higher proton number than Y.

- Q5** Which particles have the electronic configuration 2,8,8?

0620/22/M/J/25/Q4

- 1 an argon atom, Ar
- 2 an aluminium ion, Al^{3+}
- 3 a sodium ion, Na^+
- 4 a chloride ion, Cl^-

- A** 1 and 3 **B** 1 and 4 **C** 2 and 3 **D** 2 and 4

- Q6** The electronic configuration of an ion is 2,8,8.

0620/13/O/N/25/Q5

What could this ion be?

	S^{2-}	Ca^{2+}
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

key

✓ = yes

✗ = no

Q7 Which particles have the electronic configuration 2,8,8?

0620/22/M/J/25/Q4

- 1 an argon atom, Ar
- 2 an aluminium ion, Al^{3+}
- 3 a sodium ion, Na^+
- 4 a chloride ion, Cl^-

A 1 and 3 **B** 1 and 4 **C** 2 and 3 **D** 2 and 4

Q8 Which statement about atoms or ions is correct?

0620/22/O/N/25/Q5

- 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.

Q9 Sulfur atoms can form the negative ion S^{2-} .

0620/22/F/M/25/Q4

Three other atoms or ions are listed.

- argon, Ar
- calcium, Ca
- oxide, O^{2-}

How many of these atoms or ions have the same electronic configuration as S^{2-} ?

A 0 **B** 1 **C** 2 **D** 3

Q10 Element T has two isotopes, $^{12}_6T$ and $^{14}_6T$.

0620/22/F/M/25/Q5

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.

Q11 The table shows information about four different particles.

0620/21/O/N/25/Q3

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

Q12 The electronic configurations of two elements are given.

0620/21/2/M/J/24/Q5

element L: 2,8,8,1

element M: 2,8,4

Which row identifies the group number and the period number for element L and element M?

	element L		element M	
	group number	period number	group number	period number
A	I	4	IV	3
B	I	4	III	4
C	IV	1	III	4
D	IV	1	IV	3

Q13 The atomic structures of four particles, W, X, Y and Z, are shown. 0620/21/M/J/23/Q3

	electrons	neutrons	protons
W	2	2	2
X	2	2	3
Y	2	3	2
Z	3	2	3

Which particles are isotopes of the same element?

- A** W and X **B** W and Y **C** X and Y **D** X and Z

Q14 Nitrogen forms a nitride ion with the formula N^{3-} . 0620/21/M/J/23/Q5

Which particle does **not** have the same electronic configuration as the nitride ion?

- A** Al^{3+} **B** Cl^{-} **C** Na^{+} **D** O^{2-}

Q15 X and Y are atoms. 0620/21/O/N/23/Q4

- X and Y have the same number of electron shells.
- X and Y have the same number of outer electrons.
- X and Y have different mass numbers.

Which statements about X and Y are correct?

- 1 X and Y are isotopes.
- 2 X and Y have the same total number of electrons.
- 3 X and Y have the same chemical properties.

- A** 1, 2 and 3 **B** 1 and 2 only **C** 1 and 3 only **D** 2 and 3 only

Q16 X and Y are two different elements.

0620/22/M/J/22/Q4

X and Y have the same number of nucleons.

Which statement about X and Y is correct?

- A** They have the same physical properties.
- B** Their atoms have the same number of electrons.
- C** They are in different groups of the Periodic Table.
- D** They have different relative masses.

Q17 Particle P has an atomic number of 18, a mass number of 40 and no overall charge.

Particle Q has an atomic number of 19, a mass number of 40 and a single positive charge.

Which statement is correct?

0620/23/M/J/22/Q5

- A** They are isotopes of the same element.
- B** They are both ions.
- C** Q has more neutrons than P.
- D** They have the same number of electrons in their outer shell.

Q18 Element X has 7 protons.

0620/21/M/J/21/Q4

Element Y has 8 more protons than X.

Which statement about element Y is correct?

- A** Y has more electron shells than X.
- B** Y has more electrons in its outer shell than X.
- C** Y is in a different group of the Periodic Table from X.
- D** Y is in the same period of the Periodic Table as X.

IGCSE Atomic Structure (Easy)

Marking Scheme

Question	Answer	Reference
1	B	0620/11/M/J/25/Q3
2	B	0620/11/M/J/25/Q4
3	A	0620/11/M/J/25/Q5
4	A	0620/13/M/J/25/Q4
5	A	0620/22/M/J/25/Q3
6	D	0620/21/M/J/25/Q3
7	B	0620/21/O/N/25/Q5
8	B	0620/23/M/J/25/Q4
9	C	0620/23/M/J/25/Q3
10	D	0620/23/O/N/25/Q3
11	C	0620/23/O/N/25/Q4
12	C	0620/22/M/J/24/Q3
13	B	0620/22/O/N/24/Q3
14	B	0620/21/M/J/24/Q4
15	B	0620/21/O/N/24/Q3
16	B	0620/23/M/J/24/Q4
17	A	0620/21/M/J/23/Q4
18	C	0620/21/M/J/22/Q3
19	B	0620/21/O/N/22/Q4
20	C	0620/23/O/N/22/Q4

IGCSE Atomic Structure (HARD)

Marking Scheme

Question	Answer	Reference
1	A	0620/11/O/N/25/Q2
2	A	0620/11/O/N/25/Q3
3	D	0620/13/M/J/25/Q3
4	A	0620/13/O/N/25/Q6
5	B	0620/22/M/J/25/Q4
6	A	0620/13/O/N/25/Q5
7	B	0620/22/M/J/25/Q4
8	C	0620/22/O/N/25/Q5
9	B	0620/22/F/M/25/Q4
10	B	0620/22/F/M/25/Q5
11	C	0620/21/O/N/25/Q3
12	A	0620/21/M/J/24/Q5
13	B	0620/21/M/J/23/Q3
14	B	0620/21/M/J/23/Q5
15	A	0620/21/O/N/23/Q4
16	C	0620/22/M/J/22/Q4
17	D	0620/23/M/J/22/Q5
18	A	0620/21/M/J/21/Q4