

FREE SAMPLE: THE FIRST 3 QUESTIONS

PAPER 1

40 marks · Questions 1 – 40 · multiple choice (A – D) · 1 h

Answer ALL questions. For each question from 1 to 40, four options are given. One of them is the correct answer. Make your choice (A, B, C or D). Each question carries 1 mark. Questions 1 – 20 are on Chemistry and questions 21 – 40 are on Biology.

1. The table gives the melting points and boiling points of four substances. Which substance is a gas at 50 °C? [1 mark]

substance	melting point / °C	boiling point / °C
P	–210	–196
Q	232	2602
R	114	184
S	–7	59

- A P
- B Q
- C R
- D S

2. How many neutrons are there in one ion of $^{15}_7\text{N}^{3-}$? [1 mark]

- A 8
- B 10
- C 15
- D 22

3. A particle contains 11 protons, 12 neutrons and 10 electrons. Which of the following is its correct symbol? [1 mark]

- A $^{23}_{11}\text{Na}^+$
- B $^{23}_{12}\text{Mg}^+$
- C $^{23}_{11}\text{Na}^-$
- D $^{24}_{11}\text{Na}^+$

THE WORKED ANSWERS TO THOSE 3 QUESTIONS

1. The table gives the melting points and boiling points of four substances. Which substance is a gas at 50 °C? [1 mark] [Melting and boiling points]

substance	melting point / °C	boiling point / °C
P	-210	-196
Q	232	2602
R	114	184
S	-7	59

Correct answer: A — P

- A substance is a solid below its melting point, a liquid between its melting point and its boiling point, and a gas above its boiling point.
- At 50 °C, P is a gas.
- Why the other options are wrong:
 - B (Q): at 50 °C it is a solid
 - C (R): at 50 °C it is a solid
 - D (S): at 50 °C it is a liquid

LOS: Matter: Structures and Properties · Melting and boiling points

KEY TAKEAWAY

Compare the temperature with the melting and boiling points to find the state.

2. How many neutrons are there in one ion of $^{15}_7\text{N}^{3-}$? [1 mark] [Atomic structure]

Correct answer: A — 8

- In the notation, the upper number is the nucleon number $A = 15$ and the lower number is the proton number $Z = 7$.
- Number of neutrons = $A - Z = 15 - 7 = 8$.
- Why the other options are wrong:
- B (10): a different particle count
- C (15): the nucleon number
- D (22): the two numbers were added

LOS: Matter: Structures and Properties · Atomic structure

KEY TAKEAWAY

Protons = Z ; neutrons = $A - Z$; electrons = $Z - \text{charge}$.

3. A particle contains 11 protons, 12 neutrons and 10 electrons. Which of the following is its correct symbol? [1 mark] [Atomic structure]

Correct answer: A — $^{23}_{11}\text{Na}^+$

- Protons = 11, so the element is Na ($Z = 11$).
- Nucleon number $A = \text{protons} + \text{neutrons} = 11 + 12 = 23$.
- Charge = protons – electrons = $11 - 10 = +1$, so the particle is a cation.
- Why the other options are wrong:
- B ($^{23}_{12}\text{Mg}^+$): the element is fixed by the number of protons
- C ($^{23}_{11}\text{Na}^-$): the charge has the wrong sign
- D ($^{24}_{11}\text{Na}^+$): the nucleon number is the number of protons plus neutrons

LOS: Matter: Structures and Properties · Atomic structure

KEY TAKEAWAY

Charge = number of protons – number of electrons.

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