

**A Level Chemistry B (Salters)**  
**H433/01** Fundamentals of chemistry

Elements of Life

**Question Set 1**

Multiple Choice Questions

1 What is a possible mass number of a magnesium isotope?

- A 12
- B 23.99
- C 24
- D 24.3

Your answer

[1]

2 An element forms ions with a charge of 3+.

What could be the electron configuration of the atoms of the element?

- A  $1s^22s^22p^3$
- B  $1s^22s^22p^63s^23p^63d^14s^2$
- C  $1s^22s^22p^63p^1$
- D  $1s^22s^22p^63s^23p^63d^{10}4s^24p^3$

Your answer

[1]

3 Some models of the structure of the atom are described below.

- 1 Atoms are spheres.
- 2 Atoms have a dense nucleus.
- 3 The electrons are arranged in shells.
- 4 Atoms have protons and electrons embedded in them.

Which row represents the historical sequence of these models, with the earliest first?

<b>A</b>	1	3	2	4
<b>B</b>	2	1	4	3
<b>C</b>	2	1	2	4
<b>D</b>	1	4	2	3

Your answer

[1]

4 What is the bond angle (in degrees) in the  $\text{NH}_2^-$  ion?

A  $104.5^\circ$

B  $107^\circ$

C  $120^\circ$

D  $180^\circ$

Your answer

[1]

5 5.6 g of Fe ( $A_r = 56$ ) and 4.0 g of S ( $A_r = 32$ ) are heated in air until no further reaction occurs. All the iron is converted to FeS and the rest of the sulfur forms  $\text{SO}_2$ .

What is the mass (in grams) of the sulfur dioxide formed?

A 1.6

B 4.0

C 8.0

D 10.4

Your answer

[1]

6 A student has  $25 \text{ cm}^3$  of a  $0.014 \text{ mol dm}^{-3}$  solution.

How much water should be added to make the solution  $0.010 \text{ mol dm}^{-3}$ ?

A  $10 \text{ cm}^3$

B  $14 \text{ cm}^3$

C  $35 \text{ cm}^3$

D  $49 \text{ cm}^3$

Your answer

[1]

7 Which equation represents a possible fusion reaction?

A  ${}_1\text{H} + {}_1\text{H} \rightarrow {}_2\text{H}$

B  ${}_1\text{H} + {}_3\text{H} \rightarrow {}_4\text{He}$

C  ${}_1\text{H} + {}_1\text{H} \rightarrow {}_2\text{He}$

D  ${}_1\text{H} + {}_2\text{He} \rightarrow {}_3\text{Na}$

Your answer

[1]

8 Which solutions when mixed would give a solution of a salt?

- A barium hydroxide and sulfuric acid
- B lead nitrate and sulfuric acid
- C silver nitrate and hydrochloric acid
- D lithium hydroxide and hydrochloric acid

Your answer

[1]

9 Which statement about an atomic emission spectrum is correct?

- A It occurs when electrons absorb energy.
- B The wavelength of a line is proportional to the energy lost by electrons.
- C The wavelengths of the lines are the same as in an absorption spectrum of the same element.
- D The lines in the emission spectrum of lithium give a yellow colour to a lithium flame.

Your answer

[1]

10 Which statement about p-orbitals is correct?

- A A p-orbital is spherical in shape.
- B A p-orbital can contain two electrons.
- C There are six p-orbitals in a p-subshell.
- D An element with outer configuration  $p^2$  has both electrons in the same p-orbital.

Your answer

[1]

11 Which row is correct?

	Species	Protons	Neutrons in isotope	Electrons
A	F <sup>-</sup>	9	10	11
B	Ne	10	10	10
C	Na <sup>+</sup>	11	10	11
D	Mg <sup>2+</sup>	14	10	12

Your answer

[1]

12 Sodium carbonate reacts with hydrochloric acid as shown in the equation.



What mass (in grams) of  $\text{Na}_2\text{CO}_3$  will react exactly with  $50\text{ cm}^3$  of  $2.0\text{ mol dm}^{-3}$   $\text{HCl}$ ?

- A 0.05
- B 5.3
- C 10.6
- D 21.2

Your answer

[1]

13 Which statement about an atom of  $^{23}\text{Na}$  is correct?

- A It is an isomer of sodium.
- B It has an atomic number of 23.
- C It has 12 neutrons in its nucleus.
- D It has a mass number of 11.

Your answer

[1]

14 Which substance in the table has a giant ionic structure?

Substance	Melting point	Solubility in water	Electrical conductivity
A	High	Insoluble	Conducts when solid or molten
B	High	Insoluble	None
C	Low	Soluble	None
D	High	Soluble	Conducts when molten or in solution

Your answer

[1]

**15** When all the water is driven off from 11.89g of  $\text{NiCl}_2 \cdot x\text{H}_2\text{O}$ , the residue weighs 6.49g.

What is the value of  $x$ ?

- A** 2
- B** 3
- C** 4
- D** 6

Your answer

[1]

**16** A student adds  $10\text{ cm}^3$  of water to  $12\text{ cm}^3$  of a  $0.010\text{ mol dm}^{-3}$  solution.

What is the resulting concentration in  $\text{mol dm}^{-3}$ ?

- A** 0.0045
- B** 0.0055
- C** 0.0083
- D** 0.018

Your answer

[1]

**17**  $0.125\text{ mol}$  of  $\text{CuO}$  is reacted with excess sulfuric acid and the solution allowed to crystallise.

What mass of hydrated copper sulfate,  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ , is formed if the yield is 75.0%?

- A** 15.0g
- B** 20.0g
- C** 23.4g
- D** 31.2g

Your answer

[1]

**Total Marks for Question Set 1: 17**

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