

All questions are for both separate science and combined science students**Q1.**

This question is about the periodic table.

Sodium and potassium are in Group 1 of the periodic table.

- (a) Give **one** similarity and **one** difference between the electronic structures of sodium and potassium.

Similarity _____

Difference _____

(2)

Group 1 elements react with water.

- (b) Give **two** observations made when potassium reacts with water.

1 _____

2 _____

(2)

- (c) Potassium hydroxide solution is produced when potassium reacts with water.

What is the colour of universal indicator when added to potassium hydroxide solution?

Give **one** reason for your answer.

Colour of universal indicator _____

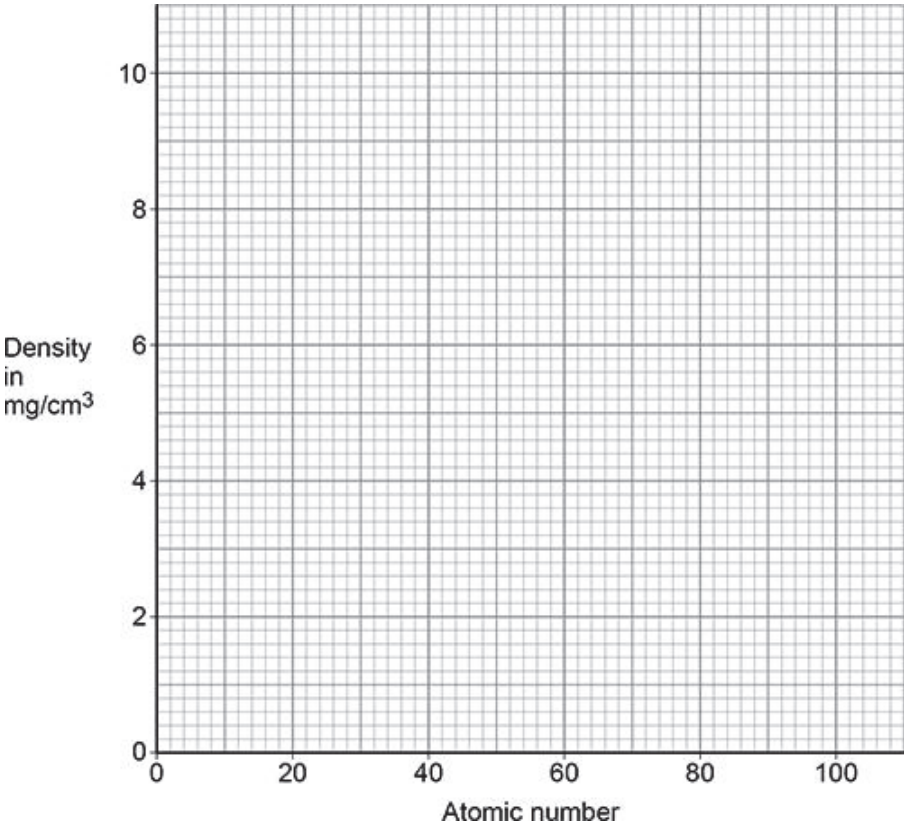
Reason _____

(2)

The table below shows the densities of some of the elements in Group 0 of the periodic table.

Element	Atomic number	Density in mg/cm^3
Helium	2	0.2
Neon	10	0.8
Argon	18	1.6
Krypton	36	X
Xenon	54	5.4
Radon	86	9.1

(d) Plot the data from the table above on the figure below.



- (e) Estimate the density (**X**) of krypton.

Use the figure and table above.

Density = _____ mg/cm³

(1)

- (f) The elements in Group 7 are called the halogens.

A more reactive halogen can displace a less reactive halogen from a solution of its salt.

Which combination of solutions will produce a reaction when mixed?

Tick (✓) **one** box.

Chlorine and potassium fluoride

☐

Chlorine and potassium bromide

☐

Bromine and potassium fluoride

☐

Bromine and potassium chloride

☐

(1)

- (g) Which of the following describes the trends going down Group 7?

Tick (✓) **one** box.

Relative molecular mass decreases and boiling point decreases.

☐

Relative molecular mass decreases and boiling point increases.

☐

Relative molecular mass increases and boiling point decreases.

☐

Relative molecular mass increases and boiling point increases.

☐

(1)

(Total 11 marks)

Q2.

This question is about the periodic table.

The figure below shows an early version of the periodic table published by a scientist.

H							
Li	Be	B	C	N	O	F	
Na	Mg	Al	Si	P	S	Cl	
K Cu	Ca Zn	? ?	Ti ?	V As	Cr Se	Mn Br	Fe Co Ni
Rb Ag	Sr Cd	Y In	Zr Sn	Nb Sb	Mo Te	? I	Ru Rh Pd

- (a) The scientist left gaps in the periodic table in the figure above.

Each gap is represented by a question mark (?).

Give **one** reason why the scientist left gaps in this periodic table.

(1)

- (b) Which scientist published the periodic table in above figure?

Tick (✓) **one** box.

Bohr

11

Chadwick

7

Mendeleev

11

(1)

- (c) The modern periodic table is different from the periodic table in above figure.

One extra group of elements has been added.

What is the name of the extra group of elements in the modern periodic table?

Tick (✓) **one** box.

Alkali metals

☐

Halogens

☐

Noble gases

☐

(1)

- (d) Why do the elements in Group 1 of the modern periodic table have similar chemical properties?

Tick (✓) **one** box.

The elements all form negative ions.

☐

The elements all have one electron in the outer shell.

☐

The elements all have the same number of shells.

☐

(1)

- (e) **Table 1** shows the melting points of the first five elements going down Group 1.

Table 1

Element	Melting point in °C
Lithium	181
Sodium	98
Potassium	X
Rubidium	39
Caesium	29

Predict value **X**.

X = _____ °C

(1)

- (f) Give **one** observation you would see when a small piece of potassium is added to water.

(1)

- (g) **Table 2** shows information about the first five elements going down Group 7.

Table 2

Element	State at 150 °C	Symbol	Formula of the compound with hydrogen
Fluorine	gas	F	HF
Chlorine	_____	Cl	HCl
Bromine	gas	Br	HBr
Iodine	liquid	I	HI
Astatine	solid	At	_____

Complete **Table 2**.

(2)

- (h) The elements in Group 7 consist of molecules.

What is the formula of a molecule of bromine?

Tick (✓) **one** box.

Br

☐
Br₂
☐
Br²
☐

2Br

☐

(1)

(Total 9 marks)