A5 **(a)** Fluorine, chlorine, bromine and iodine are placed in the same Group of the Periodic Table.

(i) State the common name used to describe elements in this Group.

Halogens

(ii) State the Group in which the elements are placed and explain why they are placed in that Group.

group VII they have seven electrons in the outermost shell

(iii) Which of the above named elements is a solid at room temperature and pressure?

Iodine is a solid

[4]

(b) Chlorine reacts with sodium bromide to give sodium chloride and bromine according to the equation below.

$Cl_{2(g)} + 2NaBr_{(aq)} \rightarrow 2NaCl_{(aq)} + Br_{2(aq)}$

(i) Explain why the above reaction is possible.

chlorine is able to displace bromine because chlorine is more reactive than bromine

A3 Elements **X** and **Y** are represented respectively by the symbols:

$^{10}_{4}\mathbf{X}$ $^{20}_{9}\mathbf{Y}$

(a) What do the following numbers stand for in these atoms?

(i) 10 and 20 in both **X** and **Y** respectively.

10 and 20 are mass numbers

[1]

(ii) 4 and 9 in both **X** and **Y** respectively.

4 and 9 are atomic numbers

[1]

(b) Give the Period and Group for elements **X** and **Y**.

X: Period 2 Group II [1]

Y: Period 2 Group VII [1]

(c) Which element **X** or **Y** is a metal?

X is a metal

[1]

A5

			$^{1}_{1}H$					$^{4}_{2}He$
				$^{11}_{5}B$	$^{12}_{6}C$	$^{14}_{7}N$	$^{16}_{8}O$	$^{19}_{9}F$	$^{20}_{10}Ne$
				$^{27}_{13}Al$	$^{28}_{14}Si$	$^{31}_{15}P$	$^{32}_{16}S$	$^{35.5}_{17}Cl$	$^{40}_{18}Ar$

The section of the Periodic Table above shows the first 20 elements. Study the table and answer the questions that follow.

(a) **(i)** On the table assign Group and Period numbers to the elements. [2]

(ii) How many Groups and Periods can you identify from the above Periodic Table?

Number of Groups: 8 groups

Number of Periods: 4 periods [2]

(b) Name any **two** noble gases and state a use of one of them.

Name **1**: Helium used in balloons

2: Argon used in bulbs

Use: ..... [3]

[Total 7]

A6 The grid below is part of the Periodic Table of the elements. Use it to answer the questions that follow. The letters are **not** the actual symbols of elements. The numbers represent the actual atomic numbers of the elements.

																A 9	B 10
C 11	D 12														G 16	E 17	H 18
F 19																	

(a) Using the letters shown in the grid, write down the formula of the compound formed between **A** and **D**.

D => 2, 8, 2 => valence 2 DA_2

A => 2, 7 => valence 1

[1]

(b) Describe the trend in reactivity in the Group in which C and F

In C, the reactivity increases down the group

(i) **C** and **F** are placed:

F is more reactive than C

(ii) **A** and **E** are placed:

In A and E reactivity decreases down the group. A is more reactive than E [2]

(c) State the letter representing an element which has the same electronic configuration as the stable ion of:

(i) **E** $_{17}E$ => 2,8,7 . ion of E^{-} 2,8,8 It is H

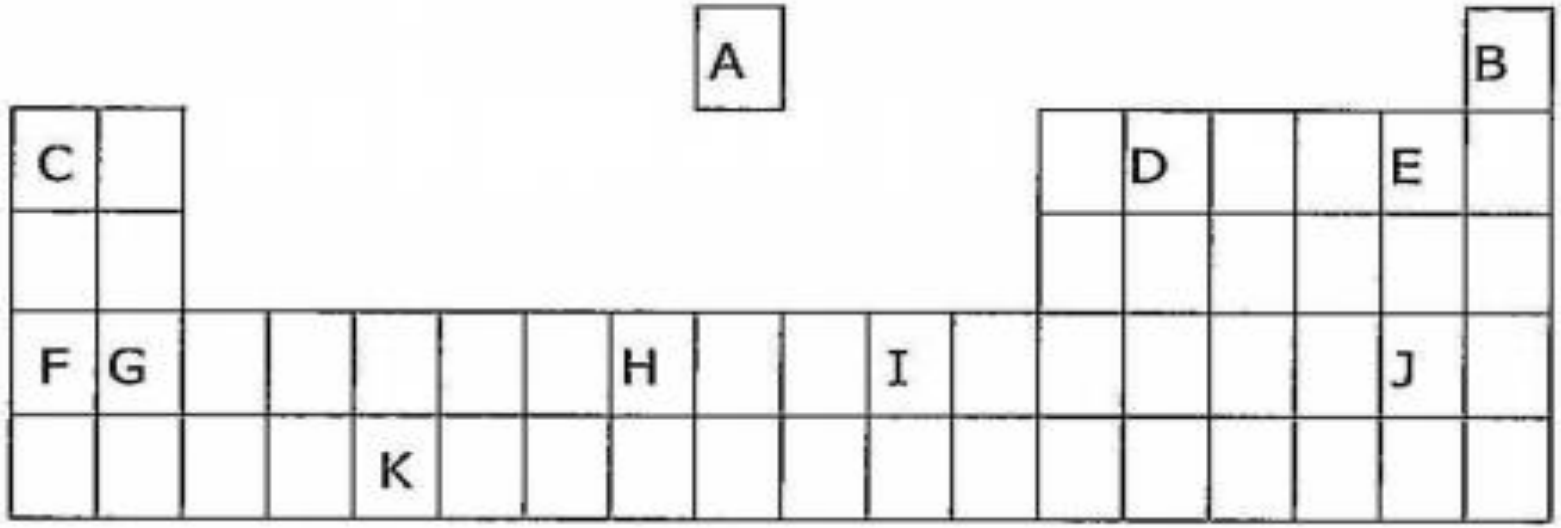
(ii) **F** $_{19}F$ => 2,8,8,1, ion of F^{+} 8,8,8 It is H [2]

(d) State a general name given to a group of elements to which the element **A** and **E** belong.

Halogens [1]

[Total: 6]

A5 The diagram shows part of the Periodic Table. Some elements are represented by letters which are not actual symbols of the elements.



Give the letter representing the element which

(a) has the lowest density

B → Helium

..... [1]

(b) is a liquid at room temperature and pressure. J → Bromine

7. Caesium, Lithium, Potassium and sodium are all in group I of the periodic table

(a) Place these metals in order of reactivity with water, most reactive metal first.

Caesium, Potassium, Sodium, Lithium

(b) Name the chemical products of the reactions between lithium and water and between sodium and water.

① Lithium hydroxide and Hydrogen. ② Sodium hydroxide and hydrogen

(c) (i) What would you expect to see if small pieces of Caesium were dropped onto water? How would the PH of the resulting solution be different from the PH of water?

It would float in water and react violently

The PH would be alkaline solution (Caesium hydroxide)

(ii) Write the full chemical equation for the reaction between Caesium and water. Include state symbols.

$2Cs_{(s)} + 2H_2O_{(l)} \rightarrow 2CsOH_{(aq)} + H_{2(g)}$

8. Chlorine, bromine and iodine are placed in this order in group VII of the periodic table.

(a) State four ways in which the physical or chemical properties of chlorine, bromine and iodine are similar.

(b) (i) Describe the trends in physical properties of chlorine, bromine and iodine.

(ii) How is the trend in chemical reactivity of chlorine, bromine and iodine shown by the displacement reactions? Give an equation for a reaction in which one element displaces another from its compound.

8(a) (i) exist as diatomic elements
(Cl_2, Br_2) I_2)

~~Bromine is coloured and melts~~

(iii) React with group I to form salts

(iv) Have seven electrons in the outer most shell

(ii) Are oxidizing agents as they gain electrons

8(b)(i) Chlorine is a gas
Bromine is a liquid
Iodine is a solid
} at room temperature and pressure

8(b)(ii) chlorine more reactive than bromine and Iodine

Bromine more reactive than iodine

$2KBr + Cl_2 \rightarrow 2KCl + Br_2$

$2KI + Br_2 \rightarrow 2KBr + I_2$

$2KI + Cl_2 \rightarrow 2KCl + I_2$

Chlorine ↑ more reactive

Bromine

Iodine ↓ Less reactive

9. The diagram below shows a table of elements taken from a larger classification of elements given on the periodic table.

I	II		III	IV	V	VI	VII	O
		hydrogen						helium
Lithium	beryllium		boron	Carbon	Nitrogen	oxygen	fluorine	neon
Sodium	magnesium		aluminum	Silicon	phosphorous	sulphur	chlorine	argon

(a) Which group contains
(i) Halogens — group VII
(ii) Alkali metals — group I

(b) From the diagram above, choose
(i) A metal from period 2 → Lithium
(ii) A non-metal with a valence of 2 → oxygen

(c) Hydrogen is difficult to classify into a group as it can be compared with both chlorine and sodium.
(i) How many electrons are there in an atom of hydrogen? one electron
(ii) What is the valence of a hydrogen atom? 1 valence
(iii) State one way in which hydrogen is similar to chlorine → It has one electron in the outermost shell
(iv) State one way in which hydrogen is similar to sodium. → It can a positive ion H+

10. Use the periodic table to answer this question

(a) Give the symbol of:

(i) A non-metal used to sterilize water — chlorine.

(ii) An element which forms diatomic molecules chlorine ck.

(iii) An element which reacts with water to give an alkaline solution Lithium

(iv) An element which forms an ion of the type x^{2-} oxygen $_8O$ 2,6 $\Rightarrow O^{2-}$

(b) Oxygen, sulphur and selenium are in group VI of the periodic table. At room temperature, oxygen is a gas and sulphur is a solid.

(i) Predict whether selenium is a liquid, a solid or a gas at room temperature solid

(ii) The trend in reactivity of group VI is similar to that in group VII. Suggest the most reactive element in group VII. oxygen

3. An element has atomic number of 16.

(a) Use the periodic table to name the element and give the symbol. Sulphur S

(b) Explains why

(i) The element is placed in group VI of the periodic table It has 6 electrons in the outermost shell

(ii) The element has a valence of two in its compound with magnesium. MgS It gains two electrons lost by magnesium

(iii) An ion of this element has two negative charges. S^{2-} gain two electrons

4. An element is in group I of the periodic table. Another element is in group VII.

(a) Suggest two ways in which the properties of these elements must be different.

(b) Two elements are in group I of the periodic table one is placed in period 2 and the other is in period 3. State two ways in which these elements must be chemically similar.

4(a)(i) Element in group I loses an electron to become stable while the element in group VII gains an electron to be stable

(ii) Group I Element is a metal and group VII element is a non metal

(iii) Group I element is monoatomic while group VII element is diatomic

4(b) (i) Have a single electron in the outer most shell

(ii) React with water to form a hydroxide and hydrogen gas

2. Use the periodic table to answer this question.

(a) Name the element in group II and Period 3 on the periodic table.

(b) State whether the element named in (a) is a metal or non-metal.

(c) Suggest the formula of the compound formed between the element named in (a) and sulphur, S.

(d) Group VII of the periodic table contains fluorine and chlorine. Explain why these elements have similar chemical properties.

2(a) Magnesium

(b) metal

(c) MgS

(d) Have