

The Periodic Table

Total Marks : 18

Q1.

In Figure 8, the letters **A, E, G, J, X** and **Z** show the positions of six elements in the periodic table.

These letters are not the symbols of the atoms of these elements.

1	2											3	4	5	6	7	0		
A												E				G			
J																	X		

Figure 8

Using the letters **A, E, G, J, X** and **Z**

(i) give the letters of the **two** elements that are non-metals

(1)

.....

(ii) give the letters of **two** elements in period 2

(1)

.....

(iii) give the letter of an element that normally forms an ion with a charge of +1.

(1)

.....

(Total for question = 3 marks)

Q2.

Gallium is in the same group in the periodic table as aluminium and in the same period in the periodic table as bromine.

(i) State in which group and period of the periodic table gallium can be found.

You may want to refer to the periodic table.

(2)

group =

period =

(ii) Gallium had not been discovered when Mendeleev created his first periodic table.

Figure 9 shows some properties of gallium that Mendeleev predicted and some of the actual properties of gallium.

property	predicted property	actual property
relative atomic mass	about 68	70
density in g/cm^3	about 6.0	5.9
melting point	lower than 40°C	29.8°C
density of oxide in g/cm^3	about 5.5	5.9

Describe how Mendeleev predicted these properties of gallium.

(2)

.....

.....

.....

.....

(Total for question = 4 marks)

Q4.

Potassium and caesium are in the same group of the periodic table.

Explain, in terms of electrons, why potassium and caesium are in the same group.

(2)

.....

.....

.....

.....

(Total for question = 2 marks)

Q5.

This question is about elements in group 1 of the periodic table.

Figure 3 shows the symbols of the first three elements in group 1 of the periodic table and their melting points.

symbol	melting point in °C
Li	181
Na	98
K	64

Figure 3

Use the periodic table to answer these questions.

(i) Give the symbol of **another** element in group 1.

(1)

.....

(ii) Give the atomic number of lithium.

(1)

.....

(iii) Describe the trend in the melting points of the elements in Figure 3.

(2)

.....
.....

(Total for question = 4 marks)

Q6.

Answer the questions with a cross in the boxes you think are correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

Fluorine, chlorine, bromine and iodine are elements in group 7 of the periodic table.

(i) State the name given to the group 7 elements.

(1)

.....

(ii) Name one other element that is in group 7.
Use the periodic table on the back of this exam paper to help you.

(1)

.....

(iii) Which element is liquid at room temperature and pressure?

(1)

- A fluorine
- B chlorine
- C bromine
- D iodine

(iv) Which element is dark-grey in colour at room temperature and pressure?

(1)

- A fluorine
- B chlorine
- C bromine
- D iodine

(Total for question = 4 marks)

Mark Schemes :

Q1.

Question number	Answer	Additional guidance	Mark
(i)	any two from E, G and X	allow mark if all three given for E allow B / boron for G allow O / O ₂ / oxygen for X allow Ar / argon allow use of lower case letters reject answers with any other letters / element names	(1)
(ii)	any two from A, E and G	allow mark if all three given for A allow Li / lithium for E allow B / boron for G allow O / O ₂ / oxygen allow use of lower case letters reject answers with any other letters / element names	(1)
(iii)	A / J	allow mark if both given for A allow Li / lithium for J allow Na / sodium allow use of lower case letters reject answers with any other letters / element names reject answers with + or - charges	(1)

Q2.

Question number	Answer	Mark
(i)	group = 3 period = 4	(2) A03- 1a - 1 1b - 1

Question number	Answer	Additional guidance	Mark
(ii)	<p>A description including:</p> <ul style="list-style-type: none"> compared to the elements in same {group / period} (1) (and used the) {trend/pattern} going {down the group / across a period} (1) 	<p><i>MP1 is for idea of which other elements to consider</i></p> <p>allow elements {above and below / to left and right / around}</p> <p>reference to reactivity can score MP2 but not MP1 e.g elements get more reactive down the group (1)</p> <p>reject incorrect alternatives to 'element' (allow 'metals') but mark on</p> <p><i>MP2 is for idea of how properties predicted from elements selected in MP1</i></p> <p>allow {'averaged' / value between} surrounding elements</p> <p>reject compare Ga with elements with similar properties/ reactions</p>	(2) A01-1

Q3.

Question number	Answer	Additional guidance	Mark
	2.8.8	allow 2,8,8 2/8/8 2 8 8 or other separator allow correct electron shell diagram	(1)

Q4.

Question number	Answer	Additional guidance	Mark
	An explanation linking <ul style="list-style-type: none">• outer (electron) shell (1)• (both have) {same number / 1} electron(s) (1)	allow both lose 1 electron (to form ion / to form noble gas configuration) reject same number of outer shells / same number of electrons MP2 depends on MP1	(2)

Q5.

Question number	Answer	Additional guidance	Mark
(i)	Rb / Cs / Fr	symbols must have uppercase letter then lowercase letter reject answers with any other symbols ignore any names	(1) A02 1

Question number	Answer	Mark
(ii)	3 / three	(1) A02 1

Question number	Answer	Additional guidance	Mark
(iii)	A description including <ul style="list-style-type: none"> (the melting points) decrease (1) as the atomic number increases/ as you go down {the group / the alkali metals / group 1} (1) 	<p>allow (melting points) {go down / get smaller} ignore less heat needed to melt it</p> <p>MP2 depends on MP1</p> <p>allow (going) down (the table / list) allow down the periodic table</p> <p>ignore references to boiling point</p> <p>higher the atomic number, lower the melting point (2) ORA</p> <p>higher in {group/ table} the higher the melting point (2) ORA</p>	(2) A03 1

Q6.

Question number	Answer	Mark
(i)	halogens	(1) AO1

Question number	Answer	Additional guidance	Mark
(ii)	astatine	allow At / At ₂	(1) AO1

Question number	Answer	Mark
(iii)	C bromine A and B are not correct as they are gases at room temperature and pressure D is not correct as iodine is a solid at room temperature and pressure	(1) AO1

Question number	Answer	Mark
(iv)	D iodine A is not correct as fluorine is pale yellow at room temperature and pressure B is not correct as chlorine is green at room temperature and pressure C is not correct as bromine is red-brown liquid at room temperature and pressure	(1) AO1