

GCSE Chemistry

Periodic Table

Question Paper

Time available: 60 minutes Marks available: 55 marks

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Figure 1

					J			
L								
		м				SS	Q	
R								

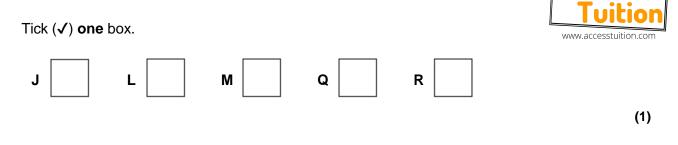
- ${\bf J},\,{\bf L},\,{\bf M},\,{\bf Q}$ and ${\bf R}$ represent elements in the periodic table.
- (a) Which element has four electrons in its outer shell?

Tick (\checkmark) one box.

	J _ L _ M _ Q _ R _	
		(1)
(b)	Which two elements in Figure 1 are in the same period?	
	and	
		(1)
(c)	Which element reacts with potassium to form an ionic compound?	
	Tick (✔) one box.	
	J _ L _ M _ Q _ R _	(1)
(d)	Which element forms ions with different charges?	
	Tick (✔) one box.	
	J L M Q R	(1)

1.

(e) Which element has three electron shells?



(f) In the 1860s scientists were trying to organise elements.



Figure 2 shows the table published by John Newlands in 1865. The elements are arranged in order of their atomic weights.

Н	Li	Be	В	С	N	0
F	Na	Mg	AI	Si	Р	S
CI	К	Са	Cr	Ti	Mn	Fe
Co,Ni	Cu	Zn	Y	In	As	Se
Br	Rb	Sr	Ce,La	Zr	Di,Mo	Ro,Ru
Pd	Ag	Cd	U	Sn	Sb	Те

Figure 2

Figure 3 shows the periodic table published by Dmitri Mendeleev in 1869.

Figure 3

	н			5										
	Li	E	Be	8	В		С		N	ŝ	0		F	
	Na	N	1g		AI		Si	j	Р	2	s		CI	
К	Cu	Са	Zn	?	?	Ti	?	V	As	Cr	Se	Mn	Br	Fe Co Ni
Rb	Ag	Sr	Cd	Y	Ir	Zr	Sn	Nb	Sb	Мо	Те	?	I	Ru Rh Pd

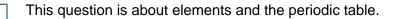
Mendeleev's table became accepted by other scientists whereas Newlands' table was not.

Evaluate Newlands' and Mendeleev's tables.

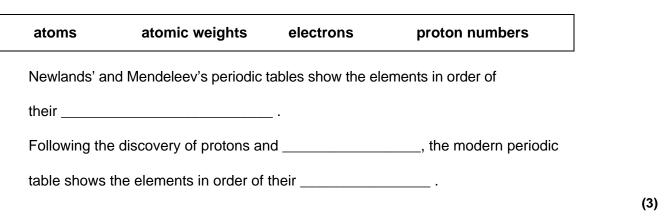
You should include:

- a comparison of the tables
- reasons why Mendeleev's table was more acceptable.

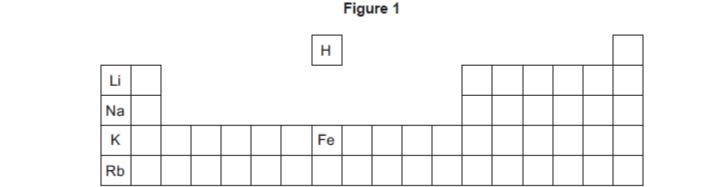
Use Figure 2 and Figure 3 and your own knowledge.



(a) Use the correct answers from the box to complete the sentences.



(b) **Figure 1** shows the position of six elements in the modern periodic table.



(i) Which **one** of these six elements has the lowest boiling point?

(ii) Complete the sentence.

In the periodic table, rubidium (Rb) is in Group ______.

(1)

(1)

- (iii) Which of these three elements is the most reactive?
 - Tick (\checkmark) one box.

Lithium (Li) Sodium (Na)



2.

(iv) Which two statements are correct?

Tick (✓) **two** boxes.

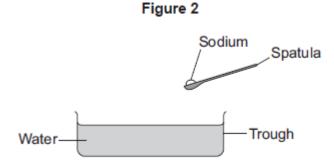
Iron has a higher density than potassium.

Iron is softer than potassium.

Iron reacts vigorously with water.

Iron forms ions that have different charges.

(c) **Figure 2** shows sodium being put into water.



Describe three observations that can be seen when sodium is put into water.





(2)

- This question is about elements and the periodic table.
 - (a) Newlands and Mendeleev both produced early versions of the periodic table.
 - (i) Complete the sentence.

3.

In their periodic tables, Newlands and Mendeleev arranged the elements in

- (ii) Name the particle that allowed the elements to be arranged in order of their atomic number in the modern periodic table.
- (b) The diagram below shows the position of nine elements in the modern periodic table.

Li				-				F	
Na								CI	
к					Cu			Br	
Rb								Т	

- (i) Which **one** of the nine elements shown in the diagram above has the lowest boiling point?
- (1)
- (ii) Copper and potassium have different melting points and boiling points.
 Give one other difference between the properties of copper and potassium.

(1)



(1)

(1)



(iii) Explain why the reactivity of the elements increases going down Group 1 from lithium

_
_
_
_
_
_
_ (4)
(Total 8 marks)
_
_
-

4.

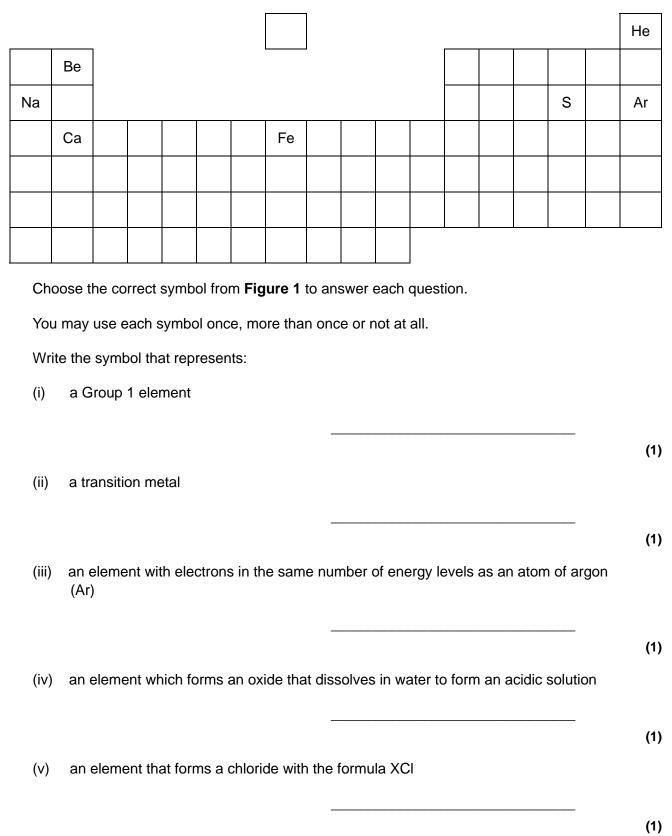


		Group	1	2											3	4	5	6	7	0	Tuition
		broup		2							1				3	*	5	0	'	He	www.accesstuition.com
]											С					
			Na																СІ		
													Cu								
(a)	Cho	ose tł	ne co	orre	ct cł	nemi	cals	sym	bol 1	to co	ompl	ete	each	ı sei	nten	ce.					
	(i)	The	eler	men	t tha	at is a	an a	lkali	i me	tal is	s				_ ·						
																					(1)
	(ii)	The	eler	men	t tha	at is a	a tra	ansit	ion I	meta	al is _.					•					(1)
	<i>(</i>)	T I	- 1			•															(1)
	(iii)	The	eler	nen	t in (rou	ip 4	IS _				·									(1)
	(iv)	The	eler	nen	t wit	h a f	ull c	oute	ren	ergy	' leve	el (s	hell)	of e	elect	rons	s is				
						- ·															(4)
(b)	Whi	ch oth	ier e	lem	ent	goes	s in t	the s	shac	led I	box?	,									(1)
(~)						9000															
																					(4)

(1) (Total 5 marks) 5.



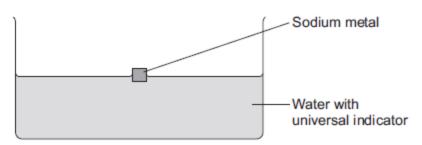




(b) A teacher put a cube of sodium metal into water containing universal indicator, as shown in **Figure 2**.







The equation for the reaction is:

2Na(s)	+	2H ₂ O(I)		2NaOH (aq)	+	H ₂ (g)
sodium	+	water	>	sodium hydroxide	+	hydrogen

(i) The sodium floated on the surface of the water. The universal indicator turned purple.

Give three other observations that would be seen during the reaction.

1	 	 	
2	 	 	
_			
3	 	 	

(ii) Name the ion that made the universal indicator turn purple.

(3)

(c) Figure 3 represents the electronic structure of a sodium atom.

6.

In the space below, draw the electronic structure of a sodium ion. Include the charge on the ion.

(Total 11 marks)
In 1869, Dmitri Mendeleev produced his periodic table of the elements.
Mendeleev placed the alkali metals in the same group.
(a) What evidence did Mendeleev use to decide that the alkali metals should be in the same group?
(b) Describe how the elements in the modern periodic table are arranged:
(i) in terms of protons
(i) in terms of electrons.
(ii) in terms of electrons.
(iii) in terms of electrons.

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(1)

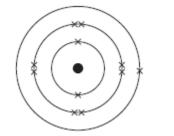


Figure 3



(c)	State two properties of transition elements that make them more useful than
alkali	metals for making water pipes.



(2)

(d) Describe and explain the trend in reactivity of the alkali metals (Group 1).

(4) (Total 9 marks)