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# ATOMIC STRUCTURE AND PERIODIC CLASSIFICATION OF ELEMENTS AND CHEMICAL BONDING

## Diaprof Camp ProWS 004.

This paper contains various questions related to atomic structure, periodic table and chemical bonding. To get the ideas and other top revisions you can visit the website [diaprofcamp.com](http://diaprofcamp.com).

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1.(i) The valency of an element with atomic number 8 is:

A. 0 B. 3 C. 2 D. 1

(ii). When an atom gains an electron it becomes:

A. an anion B. a cation C. a molecule D. an isotope

(iii) Which of the following pair of particles have the same electronic configuration: -

A. Ar and Cl B. Ar and K C. Na and K D.  $\text{Cl}^-$  and  $\text{K}^+$  E.  $\text{Na}^-$  and Cl

(iv) The oxidation state of chlorine in sodium chlorite,  $\text{NaClO}_3$  is

A. -1 B. +2 C. +5 D. +3 E. -3

(v) The symbols  ${}^{17}_8\text{M}$  and  ${}^{15}_8\text{M}$  represents:

A. Isomers B. Allotropes C. Isotopes D. Radicals E. Molecules.

(vi)

Select the most correct row given from A to E in the following table

	Element	Electronic configuration	Atomic number	valency
A	X	2:8:8:7	25	7
B	Y	2:8:4	28	4
C	M	2:8:8:8:3	5	3
D	L	2:8:8:2	20	2
E	K	2:6:8	16	2

Match each of the following items (i - iv) in list A with a correct response in list B by writing its letter in the space provided

LIST A	LIST B
i. Periodic table ii. Halogens iii. Metalloids iv. Electronegativity v. Noble gas	A. A vertical column of element in the periodic. B. A group of element with high densities and melting points and often acts as catalyst. C. Group of elements which have both Metallic and non-metallic characteristics. D. The systematic arrangement of element according to their increase in atomic number. E. Group of elements in which their shells are completely filled up. F. The ability of an atom to attract an electron. G. Group of an elements which reacts by receiving electrons. H. Group of elements which reacts quickly with water to form alkaline solution

3. Element K and L have atomic number 19 and 17 respectively, according to the periodic table;

- Write the electronic configuration of K and L.
- Which is non metal between K and L.
- Write chemical formula when K combines with L chemically.

4. (a) Element Q has 17 electrons and 18 neutrons

- What is the atomic number of Q?
  - What is the mass number of Q?
  - Write down the electronic configuration of Q.
  - Which group and period in the periodic table element Q occupy.
- (b) Calculate the oxidation number of the underlined elements below.



5. (a) Elements X and Y have atomic numbers 13 and 17 respectively.

- (i) State the type of bond when element X and Y combine.
- (ii) Write the electronic configuration of element Y.
- (iii) Which letter represents a non-metal?
- (iv) Write the chemical formula of the compound formed when elements X and Y combine.
- (v) In which group does element X belong?

(b) Write the IUPAC names for the following compounds:

- (i)  $\text{CaCl}_2$
- (ii)  $\text{Cu}_2\text{O}$
- (iii)  $\text{NaOH}$

(c) Give the chemical formula of the compounds formed by the following set of ions:

- (i)  $\text{Na}^+$ ,  $\text{SO}_4^{2-}$
- (ii)  $\text{Al}^{3+}$ ,  $\text{SO}_4^{2-}$
- (iii)  $\text{Ca}^{2+}$ ,  $\text{CO}_3^{2-}$

6. (a) State the modern periodic law

(b) Element X, Y and Z have atomic number 17, 18 and 20 respectively.

- (i) Write the electronic configuration of each element.
- (ii) Basing on reactivity, which of the above element is likely to be found in uncombined state?
- (iii) Write the chemical formula of a compound formed when X combines with Z.
- (iv) Write down three (3) characteristic of the compound formed in (iii) above.

7. (a) Observe the following part of the periodic table and answer the questions below it

<b>P</b>	<b>Q</b>					<b>U</b>	<b>R</b>
<b>S</b>	<b>T</b>						
<b>V</b>							

(i) List letters that represent the elements which are found in the same period (identify the period).

(ii) Arrange the elements in period 3 according to increase in ionization energy.

(iii) When element Q and U combine they form a compound, write its chemical formula.

(iv) Write the electronic configuration of the elements represented by the following letters.

R .....

T<sup>2+</sup> .....

8.(a) Write the formula of each compound formed between

i. Potassium and oxygen..

ii. Aluminium and chlorine.

(b) Below is part of the periodic table and the numbers represents atomic number, study the table carefully then answer the question that follow:

1							2
3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18
19	20						

(i) Write T in the space where a noble gas in period 3 would occupy

(ii) Write U in the space where the most reactive metals would occupy

(iii) Write W in the space where the most reactive non-metal would occupy

(iv) Write X in space which could be occupied by an element in period 3 capable of forming a compound XW<sub>3</sub>

(v) Write Y in group (II) period 4 element.

(vi) Write Z in group VI period 3 elements

(b) Write the chemical symbols of the following elements:

(i) Neon.

- (ii) Silicon.
- (iii) Potassium.
- (iv) Phosphorus.
- (v) Beryllium

9. (a) Study the following portion of the periodic table with some elements represented letters and answer the questions that follow

I									O
	II	III	IV	V	VI	VII			
	A				C	B			
						D			

- i. State how electronegativity varies from A to C and from B to D
  - ii. Write the electronic configuration of A, C<sup>2-</sup>, B, D
  - iii. Predict the type of bond between A and B
- (b) Write the name of the following compounds.

- (i) CuO
- (ii) Na<sub>2</sub>CO<sub>3</sub>

©. Element Q belong to period 3 and group VI of the periodic table.

- (i) Draw the atomic structure of Q
- (ii) Give the atomic number of element Q

- 10.
- (a) Define the term periodic table
  - (b) State the modern periodic law

c) Below is part of periodic table and the numbers represent atomic numbers. Study the table carefully then answer the questions that follow.

<b>group</b>							
1							
			6				
11.	12					17	

- (a) For each number, write the symbol of the corresponding element.  
1. \_\_\_\_\_ 6. \_\_\_\_\_ 11. \_\_\_\_\_ 12. \_\_\_\_\_ 17. \_\_\_\_\_
- (b) Considering the elements with atomic number 12 and 17, which is a metal and which is a non-metal.  
Metal.....non-metal.....

Give reason why group I element is called alkali metal

11. (a) Distinguish between isotopy and isotopes

(b) The percentages abundance of Cl-35 and Cl-37 are 75% and 25% respectively. Calculate the relative atomic mass