FORM TWO CHEMISTRY AUGUST HOLIDAY ASSIGNMENT

1. The information in the table below relates to elements in the same group of the periodic table. Study it and answer the questions that follows:-

Elements	Atomic size (mm)
G1	0.19
G2	0.23
G3	0.15

Which element has highest ionization energy? Give a reason. (3mks)

2. The oxides of elements "A" and "B" have the properties shown in the table below. The letters do not represent actual symbols of the elements.

A	B
A gas at room temperature	Solid normal temperature
Dissolves in water to form acidic solution	Dissolves in water to form alkaline solution

Give one example of element "A" and "B" (2mks)

3. An oxide of F has the formula F_2O_5

a) Determine the oxidation state of "F" (1mk)

b) In which group of the periodic table is element "F" (1mk)

4. Yellow phosphorus reacts with chlorine gas to form a yellow liquid. The liquid fumes when exposed to air. Explain these observations. (2mks)

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Explain why the reactivity of group (VII) elements decreases down the group. (3mks)

5. The atomic numbers of element "C" and "D" are 19 and 9 respectively. State and explain the electro conductivity of compound CD in:-

a) Solid state (1 ½ mark)

b) Aqueous state (1 ½ mark)

a) Explain why the metals magnesium and aluminium are good conductors of electricity. (1mk)

b) Other than cost, give two reasons why aluminium is used for making electric cables while magnesium is not. (2mks)

5. The table below gives information on four elements represented by letters K, L, M and N. Study it and answer the questions that follow. The letters do not represent the actual symbols of the elements.

Elements	Electron arrangement	Atomic radius (nm)	Ionic radius
K	2,8,2	0.136	0.065
L	2,8,7	0.099	0.181
M	2,8,8,1	0.099	0.181
N	2,8,8,2	0.174	0.099

a) Which two elements have similar chemical properties? Explain (2mks)
b) What is the most likely formula of the oxide of "L" (1mk)
c) Which element is a non-metal? Explain (2mks)
d) Which one of the elements is the strongest reducing agent? Explain (2mks)
e) Explain why the ionic radius of "N" is less than that of "M" (2mks)
f) Explain why the ionic radius of "L" is larger than its atomic radius. (2mks)

6. Study the information given in the table below and answer the questions that follow. The letters do not represent the actual symbols of elements.

Elements	Atomic numbers	Boiling point
S	3	1603
T	13	2743
U	16	718
V	18	87
W	19	1047

a) Select the element which belong to the same
   i) Group (1mk)
   ii) Period (1mk)
b) Which element
   i) is in gaseous state at room temperature? Explain (2mks)
   Take room temperature to be 298K
   ii) Does not form oxides (1mk)
c) Write the:-
   i) Formula of the nitrate of element T (1mk)
   ii) Equation for the reaction between element "S" and "U" (1mk)
d) What type of bond would exist in the compound formed when element "U" and "T" react? Give a reason for your answer (2mks)
e) The aqueous sulphate of element "w" was electrolyzed using inert electrodes. Name the products formed at the
   i) Cathode (1mk)
   ii) Anode (1mk)

7. The table below shows some properties of chlorine, bromine and iodine.

Elements	Formulae	Colour and state at room temperature	Solubility in water
Chlorine	Cl_2	(i).....	Soluble
Bromine	Br_2	Brown liquid	(ii).....
Iodine	I_2	(iii)	Slightly soluble

a) Complete the table below by giving the missing information in (i) (ii) (3mks)

b) Chloride is prepared by reacting concentrated hydrochloric acid with Manganese (IV) oxide.

i) Write the equation for the reaction between concentrated hydrochloric acid and manganese (IV) oxide.

ii) What is the role of manganes (IV) oxide in this reaction (1mk)

c) i) Iron (ii) chloride reacts with chlorine gas to form substance "E". Identify substance "E" (1mk)

ii) During the reaction in c (i) above, 6.30g of iron (II) chloride were converted to 8.06g of substance "E". Calculate the volume of chlorine gas used. (Cl=35.5) molar gas at room temperature = 24000 cm^3 (Fe= 56) (3mks)

d) Draw and name the structure of the compound formed when excess chlorine gas is reacted with ethane gas. (2mks)

Structure.....

Name .....

8. The grid below represents part of the periodic table. Study it and answer the questions that follows:- The letter given do not represent the actual symbols of the elements.

						A		
	B		C		D		E	
F	G							
							H	

i) Select the element that can form an ion with a change of-2. Explain your answer. (2mks)

ii) What type of structure would the oxide of C have? Explain your answer. (2mks)

iii) How does reaction of H compare with that of E? (2mks)

iv

v) Explain how you would expect the following to compare.

a) Atomic radii of "F" and "G" (1mk)

b) The pH values of aqueous solution of oxides of B and D. (2mks)

vi) The table below shows some physical properties of some substances. Use the information in the table to answer the questions that follow:-

Substances	Melting	Boiling point ^0C	Electricalconductivity	
			Solid	liquid
U	1083	2595	Good	Good
V	801	1413	Poor	Good
W	5.5	80.1	Poor	Poor
X	-114.8	-84.9	Poor	Poor
Y	3550	4827	Poor	poor

i) Which substance is likely to be (1mk)
   (I) A metal (1mk)
   (II) Liquid at room temperature (1mk)

ii) Which substance is likely to have the following structures?
   (I) Simple molecular (1mk)
   (II) Giant atomic (1mk)

10. Lithium, sodium and potassium belong to the same group of the periodic table
   i) Arrange the elements in the order of increasing ionization energy. (1mk)
   ii) Explain the trend in 2(i) above (2mks)

12. The table below gives atomic and mass numbers of some elements represented by letters "T" to "Y". The letters are not actual symbols of elements. Use it to answer questions that follows:-

Elements	T	U	V	W	X	Y
Atomic numbers	1	18	1	19	20	17
Mass numbers	2	39	1	39	40	35

a) Which element has the lowest ionization energy? (2mks)
b) Element "V" is uniquely positioned in the periodic table. It has a tendency of forming compounds by either gaining or sharing electrons. Give the formula of a compound of "V" that is formed when V gain an electron.
a) What observations would be made if chlorine gas is bubbled through aqueous sodium iodide? Explain using an ionic equation. (1mk)
b) Under certain conditions chlorine and iodine react to give iodine trichloride ($LCl_{3\,(s)}$). What type of bonding would you expect to exist in iodine trichloride? Explain. (1mk)