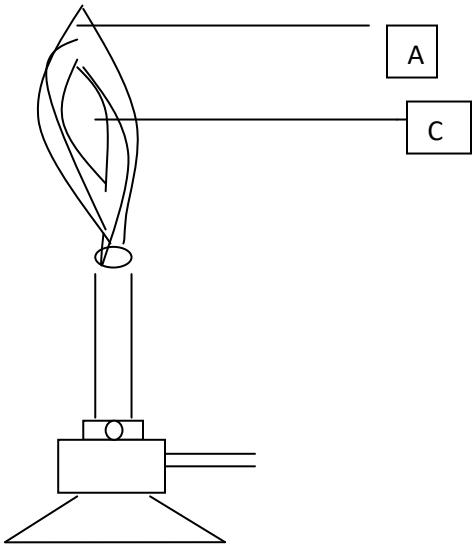
GIANCHERE FRIENDS SEC SCHOOL
FORM TWO CHEMISTRY SERIES EXAMINATIONS
TERM TWO 2021

1.The diagram below shows a Bunsen burner when in use.



a)Name the regions labeled C and A (2mks)

C……

A…….

b)State any one observation made if the air hole of the above Bunsen burner is adjusted fully. (1mk)

2.(a) Using electrons in the outermost energy level, draw the dot (.) and cross(x) diagrams for the molecules H_2O and C_2H_4 (H=1, C=6, O=8) (2mks)

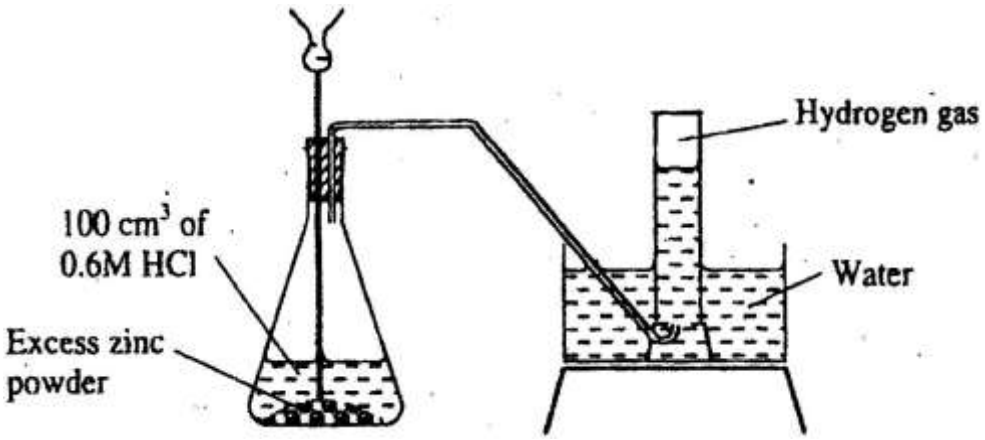
ii)H_2O

ii)C_2H_4

3. (a) Explain why the metals Magnesium and Aluminium are good conductors of electricity. (1mk)

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

4.The diagram below shows a student's set up for the preparation and collection of hydrogen gas.



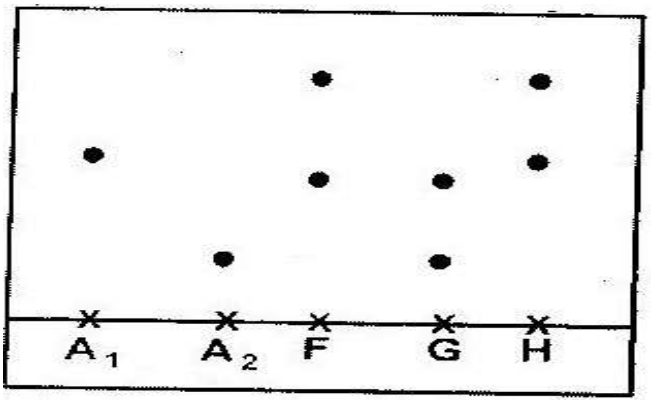
a) Supposing the student used 200cm^3 of 0.3M HC l, how would the final volume of hydrogen gas produced compare with the above? Explain. (1mrk)

b) Explain why;

i) Helium is increasingly being preferred to hydrogen in weather balloons. (1mk)

ii) Hydrogen, though an ideal fuel, is not commonly used. (1mk)

5. Samples of urine from three participants F, G and H at a sporting event were spotted on a chromatography paper alongside two from illegal drugs A_1 and A_2. The figure below shows the final chromatography after methanol solvent was added.



a) Identify the athlete who used an illegal drug. (1mk)

b) Which drug is more soluble in methanol? (1mk)

6.A mixture contains ammonium chloride, copper (II) oxide and sodium chloride. Describe how each of the substances can be obtained from the mixture. (3mks)

7. A student was provided with the following set of apparatus; A water trough, aqueous sodium hydroxide, burning candle, watch glass and a graduated gas jar. Draw a well labeled diagram of the set up of the apparatus at the end in an experiment to determine the percentage active part of air. (3mks)

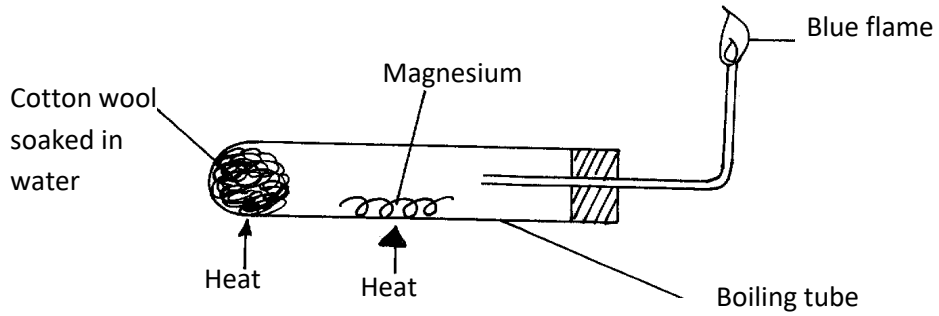
8.Diamond and graphite are allotropes of carbon.

(i) What are allotropes? (1mk)

(ii) In terms of structure and bonding explain why diamond is used in drilling through hard rocks while graphite is a lubricant (2mks)

9.Differentiate between fractional crystallization and fractional distillation. (2mks)

10.Study the diagram below and answer the questions that follow.



(a) State the observations that would be made when heat is applied. (1mk)

(b) Write chemical equations for the reactions taking place in :

(i) The boiling tube (1mk)

(ii) The blue flame (1mk)

11.The following table shows the P^H values of solutions **A B** and **C**

Solution	**A**	**B**	**C**
PH	2	**7**	11

(a) Which solution is likely to be magnesium chloride. Give a reason. (1mk)

(b) Identify the solution in which a sample of aluminium chloride is likely to dissolve. Explain (2mks)

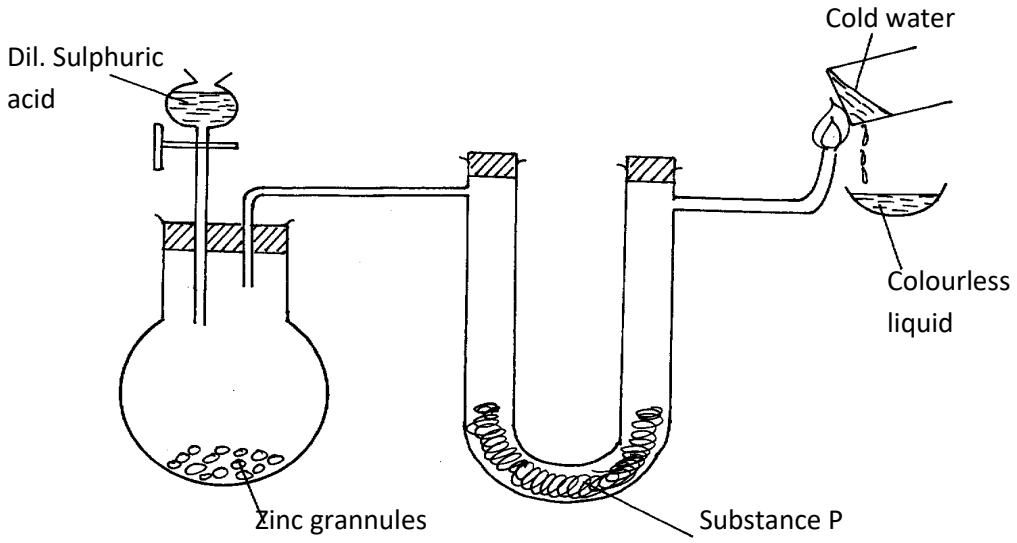
12.An element Q with atomic number 31 has two isotopes as shown below

Mass	**% abundance**
69	60.4
71	39.6

(a) Determine the number of neutrons in the isotope with mass 71. (1mk)

(b) Calculate the relative atomic mass of element **Q** (2mks)

13.Study the set up below.



(a) Name substance P (1mk)

……

(b) Describe a chemical test that would be used to identify the colourless liquid (2mks)

14.Below are properties of some elements in period 3 of the periodic table

Element	**Na**	**Mg**	**Al**
Atomic radius (nm)	0.152	0.136	0.125
Melting points (oC)	97.8	650	660

(a) Explain the trend in the melting points (2mks)

(a) Why is there a decrease in size of the atoms from Na to Al ? (1mk)

15.Calcium (Ca) and strontium (Sr) are group two elements and form ions by losing two electrons. The first and second ionoization energies of calcium and strontium are shown below.

	1^{st} I.E kJ/mole	2^{nd} I.E KJmol -1
Calcium	590	1145
Strontium	550	1064

(a) Write an equation to represent the second ionization energy of calcium (1mk)

(b) Explain why the 2^{nd} ionization energies are higher than the 1^{st} ionization energies

(1mk)

(c) Explain why the 1^{st} and 2^{nd} ionization energies of calcium are higher than those of strontium. (1mk)

16.The grid below is part of the periodic table. (The letters do not represent the actual symbols of the elements). Use the information to answer the questions that follow.

	A				B	C		D
	E		F	G			H	
I	J							
							Y	

a) State the chemical family to which the following elements J and D belong. (1 mark)

J……

D……

b) i) Write the formula of the compound formed when J reacts with B. (1 mark)

……..

ii) Write an equation for the reaction between the compound formed in (i) and water. (1 mark)

……

c) How does the reactivity of E compared with that of F? Explain. (2 marks)

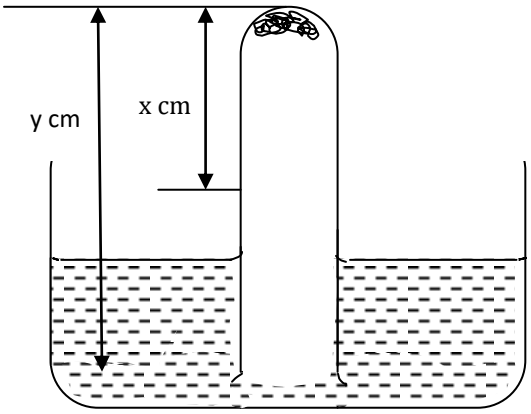
d) On the grid show by using letter L the first longest period and give a reason why you think it is the first longest period. (2 marks)

e) Write the formula of the ion of F and give the equation of its formation. (1 mark)

Ion ……..

Equation……..

17.Some moist iron wool was placed in a test tube and the tube was inverted and set up as shown below.



The apparatus was left for one week. The water level rose and iron wool turned red-brown.

(i) Write the chemical equation to show the rusting of iron. **(1 mark)**

(ii) Write the expression for an approximate percentage. **(1 mark)**

(iii) State two similarities between rusting and combustion.

(a) q **(1 mark)**

(b) **(1 mark)**

18. The table below shows properties of chlorine, bromine and iodine. Complete the blank spaces.

Element	formula	Colour and state at room temperature	Solubility
Chlorine	Cl_2	i).....	Soluble
Bromine	Br_2	Brown liquid	ii).....
Iodine	I_2	iii).....	slightly soluble

(3marks)

19.(a) what are Isotopes? (1mark)

b)Determine the number of neutrons in (1mark)

$$^{18}_{8}O$$

20.Study the table and answer the questions that follow. The letters are not actual symbols of the elements or ion.

Particle	Number of		
	Protons	Electrons	Neutrons
L	18	18	12
M	17	18	18
N	19	19	20
O	9	8	10
P	19	19	22

With reasons, choose the letters that represent

(a) A cation. (1 mark)

(b) An anion. (1 mark)

(c) A pair of isotopes. (1 mark)

"END"