



THEMI HILL SECONDARY SCHOOL
COVID 19 HOLIDAY
FORM FOUR OPEN EXAMINATION
SERIES ONE
CHEMISTRY 1

032/1

04 MAY, 2020

INSTRUCTIONS

1. This paper consist of section A,B and C with a total of fourteen questions
2. Answer all questions in section A and B and one question from section C
3. Write your full name on every page of your answer sheet
4. The following constants may be used

Atomic masses: H= 1 O=16 N=14S=32 Zn=65 C1= 35.5 CU= 64 K= 39

Avogadro's number= 6.02×10^{23}

GMV AT STP= 22.4 dm^3

1faraday =96500 coulombs

Standard pressure= 760mmHg

Standard temperature = 273k

SECTION A(15MARKS)

Answer all question in this section.

1. For each of the following items (i)- (x), choose the correct answer from among given alternatives and write its letter beside the item number in the answer sheet provided.
- (i) When substance A and B react to form new substance C, the reactants A and B are said to have_____
- A: Undergone a chemical change
B: formed solution
C: undergone physical change
D: formed a mixture
- (ii) Which of the following oxides are gaseous at room temperature?
- A. Carbon dioxide and copper (ii) oxide
B. Sulphur dioxide and copper (ii) oxide
C. Carbon dioxide and Sulphur dioxide
D. Copper (ii) oxide and iron (ii) oxide
E. Iron (iii) oxide and carbon dioxide
- (iii) Half gram (0.5g) of hydrogen gas is exploded to produce water in air. The mass of water formed is__
- A: 1.8g B. 4.5g C.0.75g D. 4.0g E. 18g
- (iv) A stead current of 4 amperes was passed through an aqueous solution of copper (ii) sulphate for 30 minutes. The mass of copper deposited at the cathode is _____
- A. 63.5g B. 31.75g C.1.185g D.2.37g E. 11.85g
- (v) A solution is found to have a PH of 5, the solution is
- A. A strong base B. neutral C. a strong acid D. a weak acid E. a weak base
- (vi) One advantage of hard water is that _____
- A. Causes the accumulation of salts in water pipes, leading to blockage
B. Causes increased tooth decay
C. Requires more soap to lather
D. Contains minerals which are useful to the body
E. Causes the formation of lime scale in boilers
- (vii) What volume of 0.2M sulphuric acid will be required to completely neutralize 25cm³ of 0.05m potassium hydroxide
- A. 0.626cm³ B. 6.125cm³ C. 6.315cm³ D.3.125cm³ E.62.6cm³
- (viii) The separation of constituents of a mixture by fractional distillation is possible because the constituents in the mixture have different_____
- A. Evaporation rates B. Freezing points C. melting points D. boiling points
E. sublimation points
- (ix) Bromide ions (Br-) differ from Bromide (Br) atoms in that the atoms have on
- A. More proton B. less proton C. more electron D. Less electron E. MORE neutron
- (x) The following set of laboratory equipment consists of volume measuring

items

- A. Beaker, balance, measuring cylinder B. burette, pipette, thermometer
C. burette, pipette, measuring cylinder D. cylinder can, balance, volumetric flask
E. spatula, funnel, conical flask

2. Match the descriptions in list A with the corresponding procedures in List B by writing the letter of the correct response beside the item number in the answer sheet provided

LIST A	LIST B
(i. A statement of how the results relate to hypothesis	A. Conclusion
(ii. A series of investigations	B. Data analysis
(iii. A statement that identifies an event, fact or situation	C. Date collection
(iv. A tentative explanation	D. Experimentation
(v. A step in which the researcher explains the results	E. Hypothesis
	F. Observation
	G. Problem identification

SECTION B (70MARKS)

Answer all questions in this section

3.

- (a) John's child was sick. When she was taken to the hospital, she was prescribed some medicine including a bottle of syrup. The bottle was written: "shake before use". What does this statement signify?
- (b) (i) what is the first step to take when you want to identify the contents of a given salt containing one anion and one cation?
(ii) in a solution of salt and water identify a solute and solvent, Justify your answer
- (c) Magnesium is a solid while chlorine is a gas at room temperature although they are in the same period in the periodic table. What is the cause of this difference?

4. (a) Briefly explain the following phenomenon with the help of relevant chemical equations for each

- (i) Hard water forms scum with soap
(ii) Carbon dioxide turns lime water milky
(iii) When water is added to white anhydrous copper (ii) sulphate it turns blue in colour.
(iv) When silver nitrate is added to sodium chloride solution, white precipitate is formed
(b) give two uses of hydrogen to justify the statement "hydrogen is important in our daily life"

5. (a) How many fluorine molecules are in 12cm^3 of fluorine gas at S.T.P?
 (b) Calculate the number of ions present in 10g of copper (ii) nitrate
6. The following equation shows the reaction between hydrogen and iodine gases to form hydrogen iodide gas

$$\text{H}_{2(g)} + \text{I}_{2(g)} \rightleftharpoons 2\text{HI}_{(g)} - \Delta \text{ HKJ mol}^{-1}$$
- (a) Explain what would happen to the position of equilibrium if
 (i) The temperature is increased
 (ii) The pressure is lowered
 (iii) Hydrogen iodide gas is pumped into the system
 (b) Sketch an energy profile for the above named reaction
7. (a) Briefly explain the following
 (i) Ionic compounds only conduct electricity in solution or molten state
 (ii) Cations migrate towards the cathode while anions migrate towards the anode during electrolysis
 (b) Briefly explain three factors for preferential discharge of ions during electrolysis
8. An atom of element X having atomic number 6 combines with two atoms of element Y having atomic number 8 to form a compound
 (a) Write the electronic configuration for atoms in element X and Y respectively
 (b) Illustrate the bond formed, write the formula of the compound and state the type of bond formed
 (c) Give any four properties of compound in 8(b) above
9. (a) Define the following terms as used in organic chemistry
 i. Homologous series
 ii. Isomerism
 (b) write the structural formula for each of the following IUPAC names
 (i) 2,3 dimethyl pentane
 (ii) 2,3 dimethyl -3- ethyl hexane
 (c) write the molecular formula for the four first members of alkene
 (d) write the structural formula and IUPAC names of all possible isomers of butane
10. (a) Which ways are the fossil fuels detrimental to the environment? Give four point
 (b) briefly explain how biogas is produced by using domestic waste
11. (a) Differentiate empirical formula from molecular formula
 (b) calculate the percentage composition by mass of water in hydrated magnesium chloride, $\text{MgCl}_2 \cdot 6\text{H}_2\text{O}$
 (c) you are provided with a compound composed of 22.2% Zinc, 11.6% Sulphur, 22.3% oxygen and the rest percentage is water of crystallization. Calculate the molecular formula of the compound if its molecular mass is 283.
12. (a) write ionic equation for the following
 (i) Laboratory preparation of hydrogen by the reaction of zinc granules and dilute hydrochloric acid

- (ii) Precipitation of barium sulphate from barium chloride and sodium sulphate
 - (iii) Neutralization of dilute sulphuric acid and potassium hydroxide solution
- (b) Consider the following elements of group seven in order which they appear in the group in the periodic table: F, Cl, Br and I
- (i) which element is the most electronegative?
 - (ii) name the least electronegative element
 - (iii) which element has the largest atom? Give reason

SECTION C(15MARKS)

Answer one (1) question from this section

- 13. Explain how life would be if there was no chemistry at all (six points)
- 14. Environment supports lives of all organisms. Its pollution has led to some major catastrophic effects. Describe terrestrial pollution by analyzing its causes, effects and the protective/ preventive measures to be taken