HARRISON UWATA GIRLS SECONDARY SCHOOL

FORM TWO EXAMINATION

032 **CHEMISTRY**

Time: 2:30 Hours **April, 2024**

INSTRUCTIONS

- This paper consists of sections **A, B** and **C** with total number of **ten (10)** questions.
- Answer **ALL** questions in the space provided.
- **All** writing must be in **black** or **blue** ink except for diagrams which must be in **pencil**.
- Write your **Assessment number** at the top right corner of every page.

SECTION A: (15 Marks)

Answer **all** questions in this section.

1. For each of the following items (i) **-** (x), choose the correct answer from the given alternatives and write its letter beside the item number in the space provided.

(i) Oxygen differ from ordinary air as follows;

A. Ordinary air is readily available in the atmosphere, while oxygen is stored in sealed and airtight cylinders.

B. Depending on oxygen composition, it can have an odour and specific colour while air is a colourless gas without a taste or odour.

C. Oxygen is necessary for the survival of the Earth's ecosystem while air is essential for human survival.

D. Oxygen do not support breathing while air is needed for supporting breathing by scuba divers and after born babies.

(ii) Which statement best describes the catalyst? It is the substance that………

A. starts, speeds up and terminates the reaction

B. alters the rate of reaction and consumed at the end of the reaction

C. slows down the rate of reaction

D. alters the rate of reaction and remains unchanged at the end of the reaction.

(iii) The following acids liberates hydrogen gas when react with zinc metal, except
A. Sulphuric acid. **B.** Hydrochloric acid. **C.** Nitric acid. **D.** Acetic acid

(iv) Swimming pools are usually bubbled with chlorine gas before letting people have fun in it. The aim of doing this is to;
A. Remove bad smell **B.** Making water attractive
C. Killing disease causing organisms **D.** Making water syrup

(v) Which among the following is the correct sequence of filtering water using a simple filter?
A. Gravel, sand, charcoal, beaker, cloth.
B. Gravel, sand, charcoal, cloth, beaker.
C. Sand, gravel, charcoal, cloth, beaker.
D. Sand, charcoal, gravel, beaker, cloth.

(vi) The choice of a good source of heat depend on the:
A. Colour of the flame **B.** Quantity of heat produced
C. Substance to be heated **D.** Types and shape of flame

(vii) Which of the following statement is true about water gas?
A. Contains hydrogen gas
B. It is the same as biogas.
C. Contains carbon monoxide and hydrogen
D. Contains hydrogen and nitrogen

(viii) Which sub-atomic particles are referred to as nucleons?
A. Neutrons and electrons
B. Protons and electrons
C. Neutrons and protons
D. Protons, electrons and neutrons

(ix) Which of the following is **TRUE** about a proton of an atom?
A. Has a negative charge
B. Its relative mass is $\frac{1}{1840}$ a. m. u.
C. It rotates around the nucleus.
D. It has mass approximately the same as that of hydrogen atom.

(x) The oxidation state of chlorine in sodium chlorate ($NaClO_3$) is:
A. -1 **B.** +2 **C.** +5 **D.** +3

Answers

(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(x)

2. Match the descriptions in **LIST A** with their corresponding terminologies in **LIST B** by writing the letter of the correct answer beside the item number in the space provided.

LIST A	**LIST B**
(i) Group of elements which react quickly with water to form alkaline solution.	**A.** Transition metals
(ii) The ability of an atom to attract bonding electrons towards itself.	**B.** Non-metals **C.** Alkali earth metals
(iii) Group of elements in which their shells are completely filled.	**D.** Electronegativity **E.** Alkali metals
(iv) Group of elements with high densities and melting points and often acts as catalyst.	**F.** Halogens **G.** Noble gases
(v) Group of elements which react slowly with water to form alkaline solution.	**H.** Group **I.** Electropositivity

Answer

LIST A	(i)	(ii)	(iii)	(iv)	(v)
LIST B					

SECTION B: (70 Marks)

Answer **all** questions in this section.

3. Zebedayo placed a grey solid substance on a deflagrating spoon; he ignited it and then lowered the spoon into a gas jar full of oxygen gas. The solid burnt with a brilliant (bright) white flame and the product of combustion was white powdered material. Finally, the product of combustion was dissolved in a beaker containing water so as to form aqueous solution.

(a) What is the name of the grey solid substance? ……………………………………

(b) Give the name of the white powdered product formed……………………………

(c) Write the word equation for the reaction between the grey substance and oxygen gas………………………………………………………………………………

(d) What will happen if both blue and red litmus papers will be dipped in a beaker containing aqueous solution of the white powdered material? Explain

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4. (a) Why zinc is the most preferred metal during laboratory preparation of hydrogen gas by the action of dilute acids with metals? Explain

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(b) Why it is important to pass the prepared hydrogen gas through silver nitrate solution, then in lead nitrate solution and finally in potassium hydroxide solution before passing the gas over a drying agent like calcium chloride? Explain

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(c) Hydrogen gas is a very promising energy source, yet its uses as a major source of energy are very limited. Explain this in terms of its storage, safety and production.

Storage: …………………………………………………………………………

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Safety: …………………………………………………………………………..

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Production: ……………………………………………………………………….

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5. (a) How the presence of impurities like common salt affects the boiling point of water? Explain. ……………………………………………………………………………

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(b) Though distilled water is pure water, people prefers potable water over distilled water for drinking. Justify this statement with two (2) reasons.

(i) ……………………………………………………………………………..

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(ii) …………………………………………………………………………….

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(c) Explain why pure water has no effects on litmus papers.

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6. (a) Explain why the entry of air during destructive distillation process of wood to make charcoal is controlled.

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(b) You paid a visit to a certain village which has a scarcity of cooking fuel but plenty of raw materials for generating biogas. How would you advise the villagers with regard to the following aspects?

(i) Nature of the gas.

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(ii) Raw materials for generating the gas.

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(iii) The process involved in generating the gas.

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(iv) Two (2) advantages of using biogas over charcoal.

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7. (a) An isotope of neon has a mass number of 21 and an atomic number of 10.

(i) How many electrons does it have? ……………………………………………

(ii) How many protons does it have? ……………………………………………

(iii) How many neutrons does it have? …………………………………………..

(iv) Write its nuclide notation …………………………………………………

(v) Write its nucleus representation

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(b) Hydrogen exists naturally into three isotopes which are; Protium ($^{1}_{1}\text{H}$), Deuterium ($^{2}_{1}\text{H}$) and Tritium ($^{3}_{1}\text{H}$). The percentage abundance of Protium is 98.9 %. If the percentage abundance of Deuterium is ten times that of Tritium, determine the relative atomic mass of hydrogen.

8. (a) Using three (3) points, briefly explain how hydrogen resembles with group VII elements?

(i) ……………………………………………………………………………..

(ii) ……………………………………………………………………………

(iii) ……………………………………………………………………………

(b) Give reason for each of the following:

(i) A cation has small size than its parent atom.

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(ii) An anion has large size than its parent atom.

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(c) Give reason for each of the following general periodic trends which appear in the periodic table.

(i) Metallic character decrease across the period from left to right.

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(ii) Electronegativity increases from left to right across the period.

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(iii) Ionization energy decrease down the group.

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9. (a) Find the oxidation number of the underlined elements in the following compounds:

(i) $Al_2(\underline{S}O_4)_3$	(ii) $Ca_3(\underline{P}O_4)_2$

(b) In which manner oxidation state differ from valency? Give four (4) points

S/N	Valency	Oxidation state
(i)		
(ii)		
(iii)		
(iv)		

SECTION C: (15 Marks)

Answer question **number 10**.

10. (a) When chemists wants to prepare different solutions in the laboratory, they prefers distilled water to be used as a solvent unlike normal tap water. Why distilled water is preferred for that purpose? Explain.

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(b) Water from different sources in urban areas is not suitable for drinking and other uses, unless it is allowed to pass through the series of stages so as to make it suitable. In sequence, briefly explain the six stages of making this water suitable.

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