THE UNITED REPUBLIC OF TANZANIA
MINISTRY OF EDUCATION SCIENCE, TECHNOLOGY AND VOCATIONAL TRAINING
MAPAMBANO EDUCATION CENTRE (MAECE)

(MAECE)

CHEMISTRY FORM IV MONTHLY TEST

Time: 2 hours Date: 02nd July, 2016

INSTRUCTIONS
This paper consists of section A and B
Answer ALL questions in all sections
All diagrams should be drawn in pencil
The following constants may be used
Atomic masses
Na = 23, C = 12, O = 16, H = 1, Cl = 35, Cu = 64, Fe = 56
Avogadro's Constant = 6.02×10^{23}
1Faraday = 96 500 C
1 dm^3 = 1 Littre = 1000 cm^3
G. M. V at s. t. p = 22.4 dm^3
Electrochemical equivalent of copper (Cu) = 0.0003281 gC^{-1}

SECTION A

1. Choose the correct answer from among the given alternatives and write its letter beside the item number.

(i) Two faradays (2F) were required to deposit one mole of a metallic element A from an aqueous solution of its salt. If element A has just one valency, the empirical formula of its phosphate is;

A. $A(PO_4)_3$ B. $A_3(PO_4)_2$ C. APO_4 D. A_3PO_4 E. $A(PO_4)_2$

(ii) Basic metal oxides react with acids to give a salt and water as the only products. Such reactions are referred to as

A. Oxidation reactions B. Neutralization reactions
C. Dehydration reactions D. Reduction reactions
E. Displacement reactions

(iii) Sodium metal is stored under oil because

A. It is volatile
B. It reacts vigorously with oxygen in air
C. It undergoes rusting when exposed to air
D. It explodes when exposed to air
E. It vaporizes when exposed to air

(iv) If 0.25 g hydrogen gas are exposed in air, the mass of water formed is

A. 1.8 g B. 2.25 g C. 4.5 g D. 18 g E. 0.18 g

(v) Atoms of elements which are in the same period of the periodic table have
A. The same number of electrons in their outer orbit
B. The same number of orbits
C. The same number of protons in their nucleus
D. The same melting and boiling temperatures
E. The same atomic number

(vi) Which of the following lists of metal ions is arranged in order of decreasing reactivity in the electrochemical series
A. Ag^+, Hg^{2+}, Cu^{2+}, K^+
B. K^+, Cu^+, Hg^+, Ag^+
C. Hg^{2+}, Ag^+, Al^{3+}, Na^+
D. Zn^{2+}, Fe^{2+}, Na^+, K^+
E. Zn^{2+}, Fe^{2+}, Al^{3+}, K^+

(vii) A steady current of 5 A was passed through an aqueous solution of copper (II) sulphate for 2000 seconds. The mass of metal deposited is
A. 20 g
B. 3.3 g
C. 4.5 g
D. 64.5 g
E. 0.33 g

(viii) Diamond and graphite are _____ of carbon.
A. Isotopes B. Atoms C. Allotropes D. Classes E. Compounds

(ix) A colorless gas turns lime water milky, the gas is
A. N_2O B. SO_2 C. CO_2 D. CH_4 E. N_2

(x) The IUPAC name of H_2SO_4 is
A. Sulphuric (IV) acid
B. Tetraoxosulphate (VI) acid
C. Hydrogen (II) Sulphate
D. Sulphuric oxosulphate
E. Hydrogen (IV) Sulphate

2. Match the terms in List A with the responses in List B by writing the letter of the correct response beside the item number.

List A	List B
(i) Acids _____	A. Pure iron
(ii) A coordinate bond __	B. Number of hydrogen ions per molecule of acid that can be displaced by a metal in solution.
iii) Isomers ____	C. Impure iron
iv) Alkalis ___	D. Acidic salts.
v) Pig iron ____	E. Number of hydroxide ions per molecule of acid that can be displaced by an anion.
vi) Basicity of an acid ___	F. Product of Bessemer converter
vii) Cast iron ____	G. Do not decompose upon burning
viii) K_2CO_3 and Na_2CO_3 __	H. Oxidation of anion and reduction of cation
ix) Electroplating ____	
(x) Blister copper _____	

	I. Each atom donates electrons to be shared J. Bases which are soluble in water K. Anode dissociates and liberate cations L. One atom donates a pair of electrons to be shared in a chemical bond. M. Have bitter taste and turn red litmus paper blue N. Organic compounds with the same molecular formula but different structural formula

SECTION B

3. (a) What are the main types of a decomposition reaction? Give an example for each type.
(b) Give the IUPAC name and chemical formula of each of the following compounds;
(i) Washing soda (ii) Caustic soda (iii) Bleaching powder

(c) Explain briefly the following observations with the help of a balanced chemical equation.
(i) Decolourization of copper (II) sulphate solution and deposition of brown metal when Zinc metal is added into a solution.
(ii) Sodium metal gives sparks when dropped into a beaker containing distilled water

4. (a) Define the following terms
(i) pH scale (ii) Indicators (iii) Basicity of acids

(b) Give an example of a compound or substance with
(i) pH value of 7.0 (ii) pH value of 1

5. (a) Define the following terms as they are used in organic chemistry
(i) Aliphatic hydrocarbons (ii) Homologous series (iii) Unsaturated hydrocarbons

(b) Write the structural formulae for each of the following organic compounds
(i) 3-ethyl, 2,4-dimethylpent−1−yne (ii)2-methylpropan-1-ol
(iii) Tetrachloromethane (iv) 3-methybut-2-ne

(c) Derive the IUPAC names for
(i) The isomers of C_5H_{12} (ii) Isomers of $C_4H_{10}O$
(iii) $(CH_3)_3.C_2(CH_3)_3$

.....Good luck.....

By: Mr. John Marcelin

THE UNITED REPUBLIC OF TANZANIA
MINISTRY OF EDUCATION AND VOCATIONAL TRAINING
MAPAMBANO EDUCATION CENTRE (MAECE)

MOCK CHEMISTRY EXAMINATION
FORM FOUR

Time 3: 00 hours

Date: 10/08/ 2016

Instructions:

- This paper consist of sections A, B and C
- Answer ALL questions from sections A and B and only one (1) from section C
- Write your name on every page of your answer sheet. (Given N = 14, C = 12, O= 16, H = 1, Cl = 35.5 Ca = 40, S = 32, Al = 27 and G.M.V. = 22.4dm^3

SECTION A: (20 Marks) Answer all questions

1. For each of the following items (i) – (x) Choose the most correct answer from the given alternatives and write its letter beside the item number.

(i) 1.4g of potassium hydroxide is dissolved in water to from 250cm^3 of solution. What is the molarity of this solution?
(a) 0.01M (b) 0.1M (c) 1.4M
(d) 5.6M (e) 6.0M [ ]

(ii) In a blast furnace carbon monoxide is prepared by passing carbon dioxide cover a red-hot. Carbon dioxide is:
(a) An accelerator (b) An oxidizing agent
(c) A reducing agent (d) A catalyst (e) Oxidized [ ]

(iii) A catalyst can be described as a substance .....
(a) That alters the rate of reaction
(b) That slows down the rate of reaction
(c) Used in every reaction so as to speed up rate of reaction
(d) That starts and speeds up the reaction
(e) That terminates chemical reaction [ ]

(iv) A covalaent bond is formed when:
(a) A metal combines with a non metal (b) Potassium and oxygen combine
(c) Ammonia is formed (d) Two metals combine
(e) An atom loses an electron [ ]

(v) A solvent can be obtained from a solution by:
(a) Evaporation followed by decantation (b) Filtration and condensation
(c) Evaporation and filtration (d) Evaporation and condensation
(e) Crystallization followed by sublimation [ ]

(vi) Aqueous sugar solution is a poor conductor of electricity because:
(a) Water and sugar are covalent compounds (b) Water is a non-electrolyte
(c) Sugar is a non-electrolyte (d) Sugar is covalent when in liquid form
(e) Sugar dissolves completely in water [ ]

(vii) The process of giving away water of crystallization to the atmosphere by a chemical substance is called:
(a) Efflorescence (b) Deliquescence
(c) Hygroscopic (d) Sublimation (e) Vaporization [ ]

(viii) Copper can be separated from a mixture of zinc and copper by adding to the mixture:
(a) Concentrated H_2SO_4 (b) Dilute H_2SO_4
(c) Aqueous solution of $ZnSO_4$ (d) Concentrated HNO_3
(e) A catalyst [ ]

(ix) Among the factors that determine the ions to be discharged at electrodes when salt solutions are electrolyzed are their .....
(a) Non metallic nature (b) Relative concentrations in the solution
(c) Relative ionic masses (d) Electronic configuration
(e) Position in periodic table [ ]

(x) The mass of sodium hydroxide contained in 25cm3 of 0.1m NaOh is:
(a) 0.5gm (b) 2.85gm (c) 250gm (d) 0.1gm (e) 25gm [ ]

2. Match the phrases in a list A with the responses in list B by writing the letter of the correct responses beside the item number.

LIST A	LIST B
(i) Oxygen	A. Green-yellow gas which rapidly bleaches damp litmus paper.
	B. Heats with cracking sound.
(ii) Sulphur dioxide	C. It rekindle a glowing splint of wood
	D. Colourless gas, extremely poisonous since it combines with
(iii) Ammonia	hemoglobin in red blood cells.
	E. Brown-ring test
(iv) Hydrogen Chloride	F. Produces a white precipitate of silver chloride in a drop of a solution of silver nitrate
(v) Carbon monoxide	G. It is the only alkaline gas
	H. Substitution reaction.
(vi) Nitrogen	I. Explodes with air when a flame is applied.
	J. Sweet aroma smell
(vii) Hydrogen	K. It is brown gas.
	L. It has very irritating smell and decolorizes potassium manganate
(viii) Chlorine	(VII) solution with no precipitates left.
	M. It turns lime water milky
(ix) Nitrogen dioxide	N. Colourless, odorless, non-poisonous gas commonly used as a refrigerant.
	O. Characteristic yellow flame.
(x) Carbon dioxide	P. Good solvent for fats and grease, non poisonous
	Q. Blackens lead (II) ethanoate paper
	R. Turns brown on exposure to air.
	S. Freezes at 00C and boils at 100^0C.
	T. Rotten-eggs smell.

SECTION B: (65 Marks)
Answer ALL questions

3. Write an Ionic equation for each of the following
(i) Barium chloride react with Sulphuric acid
(ii) Calcium chloride react with sodium carbonate

4. (a) If 0.5mol of hydrated salt ~~$x.nH_2O$~~ contain 63g of water of crystal of the oxide. Find the value of 'n'.
(b) A liquid compound x has relative atomic mass of 114 and the ration of carbon atom hydrogen atom is 4:9. Determine the molecular formula of the compound. To which homologous series of organic compound does it belong?

5. (a) What mass of 0.5 mole of aluminium sulphate $Al_2(SO_4)_3$
(b) The mass of ammonium chloride would be needed just to react completely with 14.8g of slaked lime what volume at S.T.P of ammonia will be produced.

6. Magnesium ribbon reacts with dilute hydrochloric acid according to the following equation

$$Mg_{(s)} + 2HCl_{(aq)} \longrightarrow MgCl_{2(aq)} + H_{2(g)}$$

State how the rate of production of hydrogen will be affected in each of the following cases other conditions remaining the same.

(a) A lot of small pieces of magnesium are used in place of the ribbon
(b) The acid temperature is 10^0C higher
(c) Two or three copper turnings are added
(d) More concentrated acid is used and
(e) The magnesium ribbon is squeezed to form a lump.

(a) Name the straight chain compound having the formula C_5H_{12} Draw the structural formular of the two isomers. What do you understand by the term
(i) Isomers (ii) Ester (iii) An alkyl group

(b) Typical reactions of hydrocarbons are illustrated by the equations given below
(i) $CH_4 + 2O_2 \longrightarrow CO_2 + 2H_2O$
(ii) $CH_4 + Cl_2 \longrightarrow CH_3Cl + HCl$
(iii) $C_8H_{18} \longrightarrow H_2 + C_2H_4 + 2C_3H_6$
(iv) $C_2H_4 + Br_2 \longrightarrow C_2H_4Br_2$

(c) Give the product for each of the following reactions
(i) Ethanoic acid and Sodium metal
(ii) Ethyne with water
(iii) Calcium carbide with water
(iv) Ethyne with acidified potassium permanganate
(v) Ethene with potassium permanganate
(vi) Ethanol with potassium pent chloride

8. Name the following radical and state their
(a) Valencies
(i) $NH4^+$ (ii) CO_3^{2-} (iii) HCO_3^- (iv) $SO_2O_3^{2-}$
(v) $Cr_2O_3^{2-}$ (vi) $S_2O_3^{2-}$ (vii) NO_3^- (viii) CN^-

(b) State what types of bond you would expect to be found in each of the following substance
(i) F_2 (ii) HCl (iii) O_2 (iv) H_2SO_4
(v) KNO_3 (iv) N_2 (vii) CO_2 (viii) CH_4 (ix) NH_3

9 Write down the oxidation number of elements
(a) (Given in brackets) for each of the following compounds
(i) H_2CO_3 (C) (ii) H_3PO_4 (P) (iii) $Na_2B_4O_7$ (B) (iv) NH_4NO_3 (O)
(b) (i) Name the different sources of fuels
(ii) State the classes of fuel according to their state. Give two example in each case
(iii) List four uses of fuels

SECTION B: (15 Marks)

Answer only one (1) question

10. (a) Give the meaning of the following terms
(i) Acidic soil (ii) Liming (iii) Soil structure
(b) Give three examples of gases which cause greenhouse effect
(c) Outline the causes of soil erosion (five)

11. Describe four common stages for the extraction of metals. Sodium never occurs naturally as a free element. Explain.

12. (a) What is the role of a salt bridge during an electrolytic process?
(b) Give any three importance of the metal reactivity series apart from selective discharge of ions during electrolysis.
(c) Describe four application of electrolysis
(d) State factors affecting the selective discharge of ions

BEST WISHES

THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF EDUCATION AND VOCATIONAL TRAINING

MAPAMBANO EDUCATION CENTRE (MAECE)

P.O. BOX 32272,
DAR ES SALAAM.

(MAECE)

FORM IV CHEMISTRY TEST

TIME: 3:00 HOURS

DATE: .....

Instructions

- This paper consists of sections A, B and C
- Answer ALL questions from sections A and B and only one (1) from section C
- ALL writing must be blue or black ink, Except for drawings which should in pencil
- Cellular phones are not allowed in the examination room
- Calculators are not allowed in the examination room.
- Write your name on every page of your answer sheet.

(H = 1, N = 14, S = 32, O = 16, C = 12, Cu = 64)

SECTION A: (20 Marks)

1. Write the letter of the correct answer beside the item number.

(i) Removes permanent hardness of water:
(a) Slaked lime (b) Washing soda (c) Boiling (d) Aqueous ammonia [ ]

(ii) Preparation of ammonia:
(a) Solvay process
(b) Downward displacement air
(c) Frisch process
(d) Upward delivery [ ]

(iii) A marsh gas formed when vegetable matter decomposes under water:
(a) Coal gas
(b) Water gas
(c) Acetylene
(d) Methane [ ]

(iv) Percentage composition of aluminum on the earth's surface
(a) 8 (b) 4 (c) 7 (d) 26 [ ]

(v) Absorbing of water from the atmosphere by a solid to form a solution
(a) Efflorescence
(b) Deliquescent
(c) Deliquescence
(d) Effloresce [ ]

(vi) One of the following is used in the hardening of oils to make margarine
(a) Chlorine
(b) Oxygen
(c) Hydrogen
(d) Platinum [ ]

(vii) The following substances are covalent
(a) Electrolytes
(b) Alums
(c) Metallurgies
(d) Non-electrolytes [ ]

(viii) It is used for making printers' ink and shoe-polish
(a) Sugar charcoal
(b) Animal charcoal
(c) Lampblack
(d) Wood charcoal [ ]

(ix) The molar mass of 350cm3 of a certain gas that was found gas that was found to weigh 1g at stp is:

16

(a) 28 (b) 64 (c) 17 (d) 44

(x) A science of extraction of metals:
(a) Mettalugy
(b) Metallurgy
(c) Metallogy
(d) Meteology [ ].

2. Match the items in List A with responses in List B to make meaningful sentences by writing the letter of correct answer beside the item number in the answer sheet.

List A	List B
(i) Air holes closed	A. Baking powder
(ii) $NaOH + H_2O \longrightarrow NaOH$	B. H_2SO_4
(iii) Salt – producer	C. Effloresce
(iv) Oxalic acid	D. Water
(v) Sodium hydrogen carbonate	E. Non-luminous flame
(vi) $Na2CO_3.10H_2O_{(s)} \longrightarrow Na_2CO_3 + 10H_2O_{(l)}$	F. $H_2C_2O_2$
(vii) Calcium chloride absorbs so much water from the air and forms a solution	G. Hygroscopic
(viii) $Na_2CO_3.10H_2O$	H. Luminous flame
(ix) Sulphuric (IV) acid	I. H_2SO_3
(x) Cobalt (II) chloride	J. $H_2C_2O_4$
	K. Ammonia
	L. Hydration
	M. Quicklime
	N. Deliquescent
	O. Chlorine
	P. Hydrolysis
	Q. Helium
	R. Washing soda

SECTION B: (60 Marks)
Answer all questions

3. (a) Give the meaning of the terms:
(i) Molar volume of a gas
(ii) Mole

(b) What is the number of ions present in 4.8g of sulphuric acid?

(c) Calculate the mass of oxygen required to combust all the hydrogen produced when 3g of aluminium reacted with excess dilute sulphuric acid.

4. With the aid of a well balanced equation, explain the following observations:
(i) A black copper (II) oxide changes into blue when reacts with dilute sulphuric acid.
(ii) Concentrated sulphuric acid cannot be used to dry ammonia gas.
(iii) Ethane decolorizes the acidified solution of potassium permanganate.
(iv) The calcium hydroxide (lime water) reacts with carbon dioxide
(v) Sodium hydroxide must not be used to wash aluminium vessels.

5. (a) Give the meaning of the terms:
(i) Electroplating
(ii) Anode
(iii) Electrochemical equivalent

(b) (i) State Faraday's First Law of electrolysis
(ii) What mass of copper, and volume of oxygen (measured at s.t.p) would be liberated in electrolysis by 3950 coulombs of electricity?

6. (a) What do the following terms means?
   (i) A radical
   (ii) A molecule
   (iii) An element

   (b) Give three reasons to support that `air' is a mixture

   (c) State the four assumptions of the Dalton's Atomic theory.

7. (a) Define the following terms
   (i) A dynamic equilibrium
   (ii) Position of equilibrium

   (b) State the "Le Chaterlier's Principle

   (c) What will be the effect of increase in total pressure on each of the following reversible reactions:
   (i) $2O_{3(g)} \rightleftharpoons 3O_{2(g)}$
   (ii) $N_{2(g)} + 3H_{2(g)} \rightleftharpoons 2NH_{3(g)}$
   (iii) $H_{2(g)} + Br_{2(g)} \rightleftharpoons 2HBr_{(g)}$

8. (a) Complete the table below:-

Acid-base titration	Choice of an indicator
Strong acid weak base	
Weak acid/weak ~~acid~~ base	Any indicator
Weak acid strong base	

   (b) The percentage composition by mass of concentrated commercial nitric acid is 70, its specific gravity is 1.42g/cm3 and its molar mass is 63.01g/mol
   Find the:
   (i) Molarity of the concentrated acid;
   (ii) Normality of the concentrated acid

SECTION C: (20 Marks)

9. (a) A certain hydrocarbon `N' with a formula C_2H_6 was found to have a vapour density of 30.
   (i) Give the homologous series to which a hydrocarbon `N' belongs.
   (ii) Give the open structure of the hydrocarbon `N'
   (iii) Find the molecular formula of `N'
   (iv) By using appropriate reagents and chemical equation, show how a hydrocarbon `N' is prepared from ethanol.

10. (a) What do you understand by the terms?
   (i) Soil fertility
   (ii) Nitrification
   (iii) Mulching

   (b) `A soil can be fertile but not necessarily productive.' Briefly explain the validity of this statement by giving at least four points.

   (c) (i) What is manure?
   (ii) Name five types of manure
   (iii) Nyau's Shamba requires 50kg of nitrogen per hectare so as to fulfill plant requirements. Calculate the quantity of $Ca(NO_3)_2$ in kg fertilizer required to meet this demand.

**********END**********

THE UNITED REPUBLIC OF TANZANIA
MINISTRY OF EDUCATION AND VOCATIONAL TRAINING
MAPAMBANO EDUCATION CENTRE (MAECE)

P.O. BOX 32272,
DAR ES SALAAM.

(MAECE)

FORM IV CHEMISTRY TEST

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(iii) A marsh gas formed when vegetable matter decomposes under water:
(a) Coal gas
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(iv) Percentage composition of aluminum on the earth's surface
(a) 8 (b) 4 (c) 7 (d) 26 [ ]

(v) Absorbing of water from the atmosphere by a solid to form a solution
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   (b) The percentage composition by mass of concentrated commercial nitric acid is 70, its specific gravity is 1.42g/cm3 and its molar mass is 63.01g/mol
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**********END**********

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THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF EDUCATION AND VOCATIONAL TRAINING

MAPAMBANO EDUCATION CENTRE (MAECE)

P.O. BOX 32272,
DAR ES SALAAM

CHEMISTRY FORM EXAMINATION

SERIES 2

TIME: 3HRS **DATE: 6TH AUG, 2016**

INSTRUCTIONS

1. This paper consists of section A, B and C
2. Answer all questions in section A and B and only ONE question from section C.
3. All writings must be in blue or black ink, except for drawings which must be in pencil.
4. Show all your works clearly.
5. Cell phones and calculators are not allowed in the examination room

-Atomic masses

-N= 14, O = 16, Ca = 40, H = 1, Cl = 35.5, K = 39

-G.M.V = $22.4dm^3$

-L = 6.02×10^{23}

-1F = 96500C

-$1dm^3$ = 1 Litre = $1000cm^3$ = 1000ml

SECTION A (20 marks)

1. For each of the items (I) – (x), choose the most correct answer from among the given alternatives and write its letter beside the item number.

i. The volume of a given mass of a gas is 360cm^3 at 50°C and 700mmHg pressure. What will be the volume at s.t.p.?
A. 180.2cm^3 C. 280.2cm^3
B.270.2cm^3 D. 282.0cm^3

ii. The atomicity of an element is the
A. number of protons in its atom
B. number of hydrogen in one of its molecules
C. number of atoms in one of its isotopes
D. number of atoms in one of its molecules

iii. To a solution of a nitrate in a test tube an equal volume of fresh iron (II) sulphate solution was added. Carefully concentrated sulphuric acid was poured down side of the test tube. A brown ring formed where the two layers met .The formula of the brown substance is
A.$FeSO_4.NO_2$ C. $FeSO_4.HNO_3$
B. $Fe(NO_3)_2.SO_4$ D. $FeSO_4.NO$

iv. The carbonate of the following metal does not exist.
A. Potassium C. Aluminium
B. Lead D. Iron

v. The mass of an element liberated by Faraday's constant is known as
A. Relative atomic mass of an element
B. .Chemical equivalent of an element
C. Atomic number of an element
D. Electrochemical equivalent of an element

vi. An alkane missing one hydrogen atom is known as.
A. Functional group C. Alkyl group
B. Polymer D. Cracking

vii. The following metal ~~hydrogen~~ hydroxide dissolved in excess aqueous ammonia to form complex compound is:
A. Lead (ii) ~~hydrogen~~ hydroxide C. Iron (ii) hydroxide
B. Zinc hydroxide D. Aluminium ~~hydrogen~~ hydroxide

viii. The maximum volume of the gas, measured at s.t.p ,evolved when 12.25g of potassium chlorate are heated is:
A.36.3dm^3 C. 33.6dm^3
B.13.6dm^3 D. 3.36dm^3

$2x \rightarrow 3v$
$0.1 \rightarrow v_1$
$\frac{2x}{2} = \frac{0.3}{2}$
$x = 0.15$

224
15
120
224

$39 + 127 + 3 \times 35.5$
39
87
35.5
122.5

$KClO_3 \rightarrow KCl \rightarrow O_2$
$12.25 \quad 12.25$

$2KClO_3 \rightarrow 2KCl + 3O_2$
$2 \rightarrow 3 = 0.3 = 2x$

$C = \frac{12.25}{122.5}$
$= \frac{1225}{12250}$
$= 0.1$

ix. The oxide of potassium ,sodium ,Calcium and Magnesium form alkalis because:
A. They oxidize completely in air
B. They are insoluble in water
C. They do not oxidize completely in air
D. They are soluble in water

x. A little of the substance salt in a clean and dry test tube was heated until no further change occurred. A white sublimate was observed. This indicated the presence of:
A. Zinc oxide
B. Sulphate ;Certain sulphates
C. Ammonium salt
D. Nitrate ;peroxide or (iv) oxide

2. Match the items in list A with the responses in list B by writing the letter of the correct response beside the item number.

	LIST A	LIST B
i.	A liquid used in the hydrogenation of oil	A. Hydrogen sulphide.
ii.	A catalyst used in the hydrogenation of oil	B. Coke
iii.	Turns yellow potassium dichromate paper green	C. Mercury
iv.	The colourless gas ,with smell of a rotten egg	D. Sulphur
v.	The only alkaline gas	E. Hydrogen chloride
vi.	Incomplete combustion of oils	F. Potassium and sodium
vii.	A colourless gas by oxidation on the oxygen of the air turns brown	G. Sulphur dioxide
viii.	Their chlorides are very deliquescent	H. Nickel
ix.	A colourless ,transparent substance	I. Sodium carbonate
x.	It cannot be weighed accurately	J. Magnesium and Zinc
		K. Ammonia
		L. Sodium hydroxide
		M. Diamond
		N. Nitrogen dioxide
		O. Lampblack
		P. Nitrogen
		Q. Graphite
		R. Nitrogen monoxide

CSa

SECTION B (60 marks)

Answer all questions:

3. (a) Define the following terms
i. A mixture
ii. sublimation
iii. A molar solution
iv. Boiling point

(b) Calculate the volume of dry hydrogen chloride (measured at s.t.p) that will dissolve in 250cm^3 of water to produce a 0.05M of an aqueous solution.

(c) With the aid of a balanced chemical equation, calculate the mass of the compound that would be formed when carbon combines with 72g of sulphur.

4. (a) State whether each of the following is a physical change or chemical change:
   i. The passing of an electric current through a wire
   ii. burning of paper
   iii. The dissolving of sugar in water
   iv. magnetization of iron
   v. sublimation of solid iodine
   vi. ripening of solid iodine
   vii. Ripening of fruit

   (b) Completing each of the following sentences by writing the correct answer
   i. Mixtures of two immiscible liquid is placed in a .....and allowed to stand.
   ii. A more generally useful method than decantation for separating solid from liquids is.....
   iii. .....is used to separate any solution containing liquids with different boiling points
   iv. Separating a liquid solid from solution in a liquid can be carried out by .....or .....
   v. Separating two or more dissolved solid in solution can be carried out by.....

5. (a) Define the term "Destructive Distillation".
   (b) Name the raw material used in destructive distillation of
   i. Wood charcoal
   ii. Sugar charcoal
   iii. Lampblack
   iv. Coke
   v. Pitch
   vi. Animal charcoal

   (c) State one use of each of following
   i. Coke
   ii. Pitch
   iii. Coal gas
   iv. Ammonia coal liquor

6. (a) What do you understand by the terms?
   i. A chemical equation
   ii. Balancing the equation
   iii. An ionic equation
   (b) Complete and balance each of the following chemical equations
   i. $Cu + HNO_3 \longrightarrow$
   ii. $H_2S + Pb(C_2H_3O_2)_2 \longrightarrow$
   iii. $NH_3 + O_2 \longrightarrow$
   iv. $NH_4NO_3 \longrightarrow$
   v. $HNO_3 \longrightarrow$

(c) Write the ionic equation for each of the following

i. Sodium hydroxide reacts with sulphuric acid
ii. Silver nitrate reacts with hydrochloric acid
iii. Barium chloride reacts with sodium sulphate.

7. (a) Define the terms
i. Catenation
ii. functionaf group
iii. cracking
iv. Alkyl group

(b) Name two major sources of hydrocarbons
(c) Write the open structure of each of the following compound

i. 2,4,4-trimetylpent – 1 – ene
ii. Propan – 1,2,3 – triol
iii. 2 – chloro – 2 – ethyl -3-methylpentanoic acid
iv. 2 – bromo – 2,4- difluorohexane

(d) What is the chemical formula for;
i. Chloroform
ii. Glycerol
iii. Fomic acid
iv. Lead (ii) acetate
v. Acetic acid

8. (a) 25cm^3 of a solution containing 0.196g of metal hydroxide WOH were neutralized by 35cm^3 of 0.1M hydrochloric acid solution.
i. Write down the balance chemical equation for the reaction.
ii. Calculate the molarity of the hydroxide solution.
iii. Calculate the relative molar mass of WOH.
iv. Calculate the relative atomic mass of the element 'W'.
v. What is the name and symbol of the element 'W'?

(b) Explain why it is not possible to measure 1g of sodium hydroxide?

9. (a) What do you understand by the term "Reaction Rate"?

(b) List down four factors that affect rates of a chemical reaction

(c) Explain why letter X drawn on a piece of paper disappears when sodium thiosulphate reacts with hydrochloric acid?

(c) Write the ionic equation for the reaction between sodium thiosulphate and hydrochloric acid

(d) What is the significance of a slowest step in the reaction rate?

10. (a) What do you understand by the terms
    i. Redox reaction
    ii. Oxidizing agent
    iii. Metal activity series
    iv. Reducing agent

(b) Ammonia is said to be a "reducing agent" while hydrogen peroxide is an "oxidizing agent". Give three balance chemical equations for each to support your answer

(c) Give four chemical differences between metals and non metals.

SECTION C (20 marks)

Answer only one (1) question

11. (a) define the terms:
    (i) Crop rotation (ii) Mulching (iii) Liming

(b) List and briefly explain four processes that contribute to the development of acid soils

(c)Give any four methods of fertilizer application

12. (a) state Faraday's Laws of electrolysis

(b) How an electrochemical equivalent of an element relates to its chemical equivalent?

(c) Briefly explain the applications of electrolysis in our daily life activities (Give four points).

13. (a) Mention any four (4) types of natural water

(b) Water is said to be a "universal solvent" .Explain

(c)How hard water is disadvantageous? Give three points.

BEST WISHES

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