GREENWOOD HIGH
PRELIMINARY EXAMINATION – 1
DEC 2019
SUBJECT –CHEMISTRY

Grade 10 Time: 2 Hrs
Date: 13/12/2019 Max. Mark: 80

Answers to this paper must be written on the paper provided separately
*You will **not** be allowed to write during the first 15 minutes.*
This time is to be spent in reading the question paper.
The time given at the head of this paper is the time allowed for writing the answers.

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*Attempt **all** questions from **Section I** and any **four questions** from **Section II***
The intended marks for questions are given in brackets [ ]

Section A
(Attempt all questions)

Question 1:

A. Choose the correct answer from the options given: . **[5]**

(i) $3Ca + N_2 \longrightarrow Ca_3N_2$; If 6 moles of Calcium reacts in the given equation, calculate the volume of Nitrogen that would be required for the reaction.

(a) 22.4 L (b) 0.448 L

(c) 44.8 L (d) 0.224 L

(ii) Ammonia gas is dried using

(a) Calcium oxide (b) Conc. Sulphuric acid

(c) Phosphorous pentoxide (d) Fused calcium chloride

(iii) Spurious alcohol contains ethanol and …….

(a) $CuSO_4$ (b) CH_3OH

(c) CH_3COOH (d) $FeSO_4$

(iv) Ionization potential is the energy …….

(a) required (b) produced (c) released (d) spent

(v) As we go across a period ….. increases.

(a) Atomic radius (b) electronegativity

(c) electro positivity (d) metallic nature

B. Three colorless gases P, Q, R can reduce Cu (II) oxide to copper during a metallurgical operation. Identify the gases based on the statement given below. [5]

(i) In case of P; the products after the reaction were copper metal and water.

(ii) In case of Q; the products were copper metal and carbon dioxide.

(iii) In case of R; the products were copper metal, water and nitrogen gas.

(iv) Give one chemical test to identify R in the laboratory.

(v) Give a balanced equation of reaction between Cu (II) oxide and R.

C. **Correct the following statement by adding/ replacement of a word/s. However the total meaning of the original sentence should not change.** [5]

(i) When Sulphuric acid is added to sugar, a black spongy mass of carbon and steam are formed.

(ii) Potassium bisulphate is the product formed when nitre and conc. Sulphuric acid react at temperature > 200°C

(iii) Magnetic separation is done for bauxite ore.

(iv) Article to be electroplated is always the anode.

(v) Fe(II) sulphate can be prepared by direct combination.

D. **State one observation for each of the following:** [5]

(i) Ammonium hydroxide is mixed with Magnesium chloride

(ii) Neutral litmus solution is added to sodium hydrogen carbonate solution.

(iii)When crystals of copper nitrate are heated in a test tube.

(iv) Sulphur dioxide is passed through lime water.

(v) Barium chloride solution is mixed with sodium sulphate solution.

E. **Calculate the following:** [2+1+2]

(i) Calculate the number of moles and molecules present in 1.4g of ethylene gas.

(ii) What is the vapor density of ethylene?

(iii) Calculate the % of sodium in sodium aluminum fluoride [Na_3AlF_6].

[$N_A = 6.0 \times 10^{23}$; C=12; H=1, Na=23, Al= 27, F= 19]

F. **Write the IUPAC names of the following organic compounds.** [5]

(i) $CH_3-CH_2-C\equiv CH$

(ii) $CH_3-\underset{\displaystyle CH_3}{\underset{|}{CH}}-\underset{\displaystyle Cl}{\underset{|}{CH}}-CHO$

(iii) CH_3-CH_2-COOH

(iv) $CH_3-CH_2-\underset{\displaystyle CH_3}{\underset{|}{CH}}-CH_2-OH$

(v) $CH_3-C(Br)_2-CH=CH_2$

G. Without identifying the elements, atoms of 2 elements **A and L** have electronic configurations **(2, 8, 8, 2) and (2, 6)** respectively; **[2+1+1+1]**

(i) State the group and period to which A and L belongs?

(ii) Amongst A and L which would form a polar covalent bond with hydrogen?

(iii) Draw possible bond between A and L.

(iv) Draw the structure of ammonium ion and mark the lone pair of electrons.

H. **Match the options from (i) to (v) with the statements (a) to (e)** **[5]**

(i) Monobasic acidic gas	(a) Conc. Sulphuric acid
(ii) Strong oxidizing agent in dilution	(b) acetic acid
(iii) Mineral acid	(c) hydrogen chloride
(iv) Organic acid	(d) fuming nitric acid
(v) Drying and dehydrating agent	(e) carbonic acid

Sec B
(Answer any four out of six)

Question 2:

1) Give equations for the following conversions. Identify A, B, C & D **[4]**

i) Sulphur + $HNO_3 \rightarrow A + B + H_2O$

ii) $A + O_2 \xrightarrow{V_2O_5/\,450°-500°C} C$

iii) $C + H_2O + O_2 \rightarrow D$

2) Choose the most appropriate answer from the following which fit the description. Each answer may be used only once: [4]

[Chlorine, ethane, fluorine, SO_3, duralumin, ethene, solder, PbO]

a) An alloy used for aircraft manufacture.

b) An amphoteric oxide

c) Most electronegative element.

d) Bromine water test

3) Give appropriate scientific reasons for the following statements: [2]

a) Conductance of dilute HCl is more than concentrated CH_3COOH.

b) Sulphur trioxide should not be directly dissolved in water to produce H_2SO_4.

Question 3:

1) $C_2H_5Br + KOH(alc) \xrightarrow{boil} C_2H_4 + KBr + H_2O$ [5]

a) Draw the structure of C_2H_5Br.

b) Name the type of reaction shown above.

c) Give the family general formulae of C_2H_4.

d) Give balanced equation between C_2H_4 and Hydrogen gas.

e) Give an equation to convert C_2H_5Br to ethanol.

2) A hydrocarbon contains 82.8% carbon having relative molecular mass of 58. Calculate its molecular formula. [C= 12; H=1] [1×3]

3) Also draw all possible isomers of the molecular formulae obtained in the previous question. [2]

Question 4:

1) Give **observation/s** for the following statements: [3]

a) Conc. Sulphuric acid is added to blue vitriol.

b) Cu metal is treated with conc. Nitric acid.

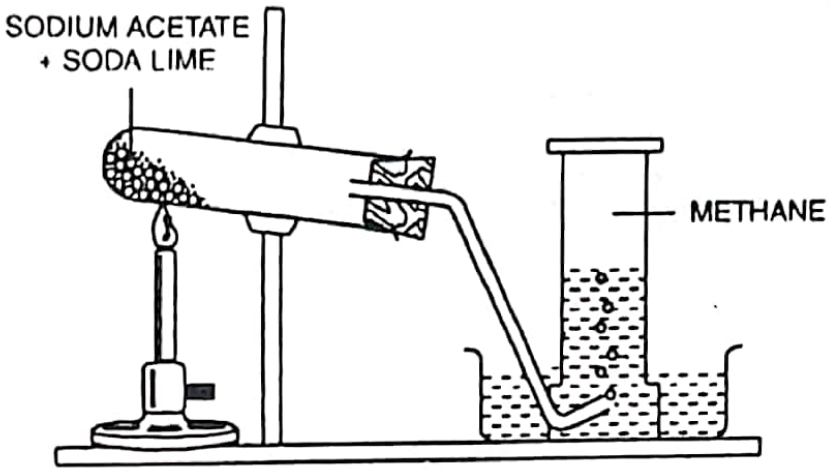
c) Aqueous solution of ammonia is added to Fe(II) sulphate solution.

2) Give **balanced** equations for: [2]

a) K_2SO_3+ Dil $H_2SO_4 \rightarrow$

b) $CaC_2 + H_2O \rightarrow$

3) The diagram is showing the preparation of methane in the laboratory, answer the following questions based on it. [1+1+1+2]



i) Give the equation for the above preparation.

ii) Why is soda lime used preferentially over NaOH?

iii) Name the homolog series to which methane belongs.

iv) What is the type of reaction shown by the compounds of the series and why?

Question 5:

1) Identify the missing information in each of the following case: [5]

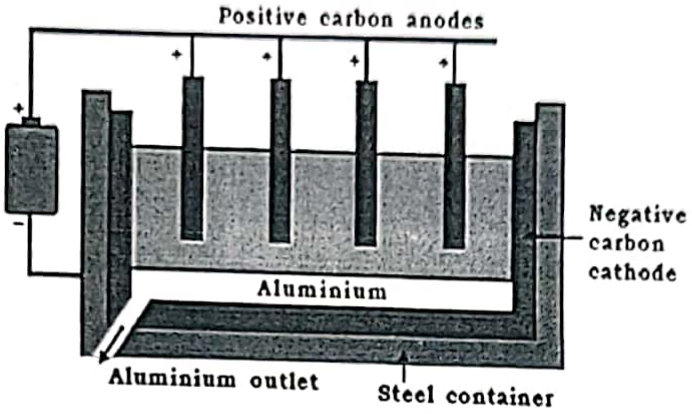
Name of the process	Temperature	Raw materials	Catalyst + promoter	Equation in the catalytic chamber	Product
1	2	3	Fe_2O_3 + Mo	4	5

2) The questions below are related to the electrolysis processes. [2]

a) Give the balanced chemical equation for the anodic reaction of acidulated water.

b) Give the cathodic reaction of the electrolysis of fused lead bromide.

3) Study the figure given below and answer the following questions:



a) Name the above process. [3]

b) Why is it necessary to add fluorspar and Cryolite to the reaction bath?

c) Give the reason why the carbon anodes have to be replaced periodically.

Question 6:

1) These questions are pertaining to organic compounds. Give answers as per the requirement. [4]
   a) The functional group of ethanal.
   b) Formulae of an acid having 3 carbon atoms.
   c) The product formed when ethanol is treated with conc. Sulphuric acid/ 160°–170°.
   d) The IUPAC name of ethyl acetate.
2) Define the following [2]
   a) Isomerism
   b) methylated spirit
3) Draw the branched structural formula of the following: [4]
   a) 2,3- dimethyl pentane
   b) 1- butanoic acid
   c) 2- butanol
   d) Pent-4,4-dichloro-3-methyl-1- al

Question 7:

1) A, B, C and D summarize the preparation of salts.

   A = Displacement

   B = Precipitation

   C = Neutralization involving titration

   D = Simple neutralization

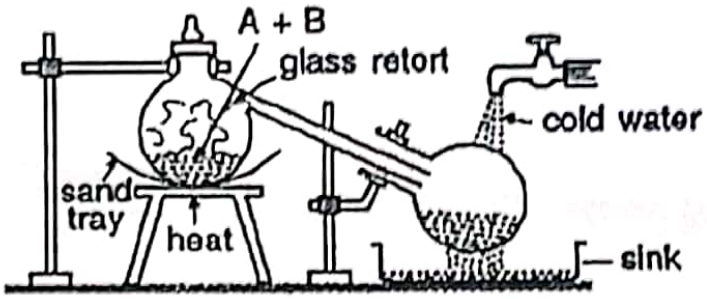
   Choose the preparation method (A, B, C, D) depending on which is relevant to each of the following: [3]

   a) Preparation of zinc sulphate

   b) Preparation of zinc carbonate.

   c) Preparation of lead nitrate.

2) The figure given below illustrates the apparatus used in the laboratory preparation of nitric acid. [4]



   a) Give equation of reaction between A & B

   b) Why should the apparatus be made of glass?

   c) Give a chemical test to identify nitric acid. No need to give equation.

   d) Why should the receiving flask be cooled from outside?

3) Match column A with correct options from Column B and C. The first one is done for you. [3]

	A	B	C
1.	Ethanol	Addition reaction	C≡C
2.	Ethane	Acidic properties	C=C
3.	Ethyne	Addition reaction	C-OH
4.	Ethene	Substitution reaction	C-C

Answer: 1. Ethanol – acidic properties- C-OH