GREENWOOD HIGH
PRELIMINARY EXAMINATION – 2
JANUARY- 2020
SUBJECT –CHEMISTRY

Grade 10 | Time: 2 Hrs
Date: 09/01/2020 | 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.

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

SECTION I (40 Marks)

Attempt all questions from this section

Question 1

a. Choose the correct answer from the options given below: [5]

i. A strong electrolyte from the following is:

a. Acetic acid b. Oxalic acid
c. Ammonium hydroxide d. Sodium hydroxide

ii. The catalyst used in contact process:

a. Copper b. Iron
c. Vanadium pentoxide d. Manganese dioxide

iii. The main components of brass are:

a. Copper and zinc b. Copper and lead
c. Copper and tin d. Copper and iron

iv. The electrolysis of acidified water is an example of :

a. Reduction b. Oxidation
c. Redox reaction d. Synthesis

v. The organic compound which undergoes substitution reaction is:

a. C_2H_2 b. C_2H_4

c. C_5H_{10} d. C_4H_{10}

b. Give one word or a phrase for the following statements: [5]

i. The process by which sulphide ore is concentrated.
ii. The tendency of an element to form chains of identical atoms.
iii. The energy released when an electron is added to a neutral gaseous isolated atom to form a negatively charged ion.
iv. A substance that conduct electricity in molten and aqueous state.
v. The formula that represents the simplest ratio of various elements present in one molecule of the compound.

c. State one relevant observation for each of the following: [5]

i. Lead nitrate is heated strongly in a dry test tube.
ii. A small piece of zinc is added to dilute hydrochloric acid.
iii. Ammonium hydroxide solution is added in excess to copper sulphate solution.
iv. Barium chloride solution is slowly added to sodium sulphate solution.
v. At the anode, when molten lead bromide is electrolyzed using graphite electrodes.

d. Write the balanced chemical equation for each of the following reactions: [5]

i. Action of concentrated sulphuric acid on carbon.
ii. Reaction of zinc with concentrated potassium hydroxide solution.
iii. Ammonium hydroxide is added to ferrous sulphate solution.
iv. Action of dilute hydrochloric acid on magnesium sulphite.
v. Catalytic oxidation of ammonia.

e. Given: [5]

i. $2C_2H_6 + 7O_2 \rightarrow 4CO_2 + 6H_2O$
2000 cc of O_2 was burnt with 400 cc of ethane.
Calculate the volume of CO_2 formed and unused O_2.
ii. Find the number of moles and molecules present in 7.1g of Cl_2.
[At. Wt. Cl=35.5]
iii. Calculate the vapour density of ethene. [C=12, H=1]

f. Do as directed: [5]

i. Draw the structural formula for each of the following:
   1. Propanoic acid
   2. But-1-ene
   3. Ethanal

ii. Draw the structural formula of the two isomers of butane.

g. Arrange the following as per the instruction given in the brackets. [5]

i. Li, F, N [increasing order of electronegativity]
ii. Na, Al, Cl [increasing order of ionization potential]
iii. O_2, N_2, Cl_2 [increasing order of number of covalent bonds]
iv. Zn^{2+}, Na^{+}, Cu^{2+} [order of preference of discharge at the cathode]
v. Br, F, Cl [decreasing order of atomic radius]

h. Fill in the blanks with the choices given in brackets: [5]

i. The mass of a substance containing particles equal to Avogadro's number is called_____ [molecule/mole]
ii. The metal which does not reacts with water or dilute sulphuric acid, but reacts with concentrated sulphuric acid is_____[Al/Cu/Zn/Fe]
iii. The alkaline behavior of liquor ammonia is due to the presence of _____ [NH^{4+} ions/ OH^{-} ions/H_3O^{+} ions]
iv. The _____compounds in fused state or aqueous solution are good conductors of electricity. [ionic/covalent]
v. The salt prepared by the method of direct combination is _____ [iron(II) chloride/ iron(III) chloride]

SECTION II (40 Marks)

Attempt *any four* questions from this section

Question 2 [3]

a. Show the formation of Hydronium ion using the electron dot diagram.
(H=1; O=8)
State the types of bonds present in it.

b. Distinguish between the following pairs of compounds using the test given within the brackets: [3]

i. Calcium sulphite and calcium carbonate (using dil. HCl)
ii. Calcium nitrate and potassium nitrate (using a flame test)
iii. Lead nitrate solution and zinc nitrate solution (using an alkali)

c. Copy and complete the following table which refers to the conversion of ions to neutral particles. [4]

Conversion	Ionic Equation	Oxidation/Reduction
Chloride ion to chlorine molecule	(i)_____	(ii) _____
Lead (II) ion to lead	(iii)_____	(iv)_____

Question 3

a. The pH values of three solutions A, B and C are given in the table. Answer the following questions: [3]

Solution	pH value
A	12
B	2
C	7

i. Which solution will have no effect on litmus solution?
ii. Which solution will liberate CO_2 when reacted with sodium carbonate?
iii. Which solution will turn red litmus solution blue? [3]

b. Name the base metal in the following alloys:
i. Duralumin
ii. Stainless steel
iii. Fuse metal [4]

c. An element Z has atomic number 16. Answer the following questions on Z:
i. State the period and group to which Z belongs.
ii. State the formula between Z and Hydrogen.
iii. What kind of a compound is this?
iv. Identify, Z is a metal or a non-metal?

Question 4

a. i. Write the balanced chemical equation to prepare ammonia gas in the laboratory by using an alkali. [3]

ii. State why concentrated sulphuric acid is not used for drying ammonia gas.

iii. Why is ammonia gas not collected over water?

b. i. Name the acid used for the preparation of hydrogen chloride gas in the laboratory. Why is this particular acid preferred to other acids? [3]

ii. Write the balanced chemical equation for the laboratory preparation of hydrogen chloride gas.

c. For the preparation of hydrochloric acid in the laboratory: [2]

i. Why is direct absorption of hydrogen chloride gas in water not feasible?

ii. What arrangement is done to dissolve hydrogen chloride gas in water?

d. For the electro-refining of copper: [2]

i. What is the cathode made up of?

ii. Write the reaction that takes place at the anode.

Question 5 [4]

a. Answer the following questions based on the extraction of aluminium by Hall-Heroult's Process:

i. Name the electrode, from which aluminum is collected.

ii. Name the process by which impure ore of aluminium gets purified by using concentrated solution an alkali.

iii. What are the components of the electrolyte other than pure alumina?

iv. Explain why it is preferable to use a number of graphite electrodes as anode instead of a single electrode, during the above electrolysis.

b. Identify the term or substance based on the descriptions given below: [4]

i. Ice like crystals formed on cooling an organic acid sufficiently.

ii. Hydrocarbon containing a triple bond and used for welding purpose

iii. The property by virtue of which the compound has the same molecular formula but different structural formulae.

iv. The compound that reacts with acetic acid to form ethyl ethanoate.

c. Give a balanced chemical equation for each of the following: [2]

i. Preparation of ethane from Sodium propionate.

ii. Action of alcoholic KOH on bromoethane.

Question 6

a. A compound gave a following data: [4]

C=57.82%, O=38.58% and the rest hydrogen. Its relative molecular mass is 166.

Find its empirical formula and molecular formula. [C=12, O=16, H=1]

b. Name the gas that is produced in each of the following cases: [4]

i. Action of dilute hydrochloric acid on sodium sulphide.

ii. Reaction of ethanol and sodium metal.

iii. Action of cold and dilute nitric acid on copper.

iv. At the anode during the electrolysis of acidified water.

c. Give a point of difference between the following pairs of terms given: [2]

i. Polar and Non-polar covalent compounds.

ii. Calcination and Roasting.

Question 7

a. State how the following conversions can be carried out. [3]

i. Ethyl chloride to ethyl alcohol

ii. Ethyl alcohol to ethene

iii. Ethene to ethane

b. Give appropriate scientific reasons for each of the following statements. [3]

i. Although copper is a good conductor of electricity it is a non-electrolyte.

ii. Electrical conductivity of acetic acid is less in comparison to that of dilute Sulphuric acid .

iii. Alkali metals are good reducing agent.

c. Calculate the volume occupied by 8 g of Sulphur dioxide at STP. [S=32, O=16] [2]

d. The mass of 5.6 litres of certain gas is 12g. What is the relative molecular mass? [2]