Pre-Final Examination 2019-20

Subject: Chemistry
Paper: 2

Inventure Academy

Name:
Grade: 10 ICSE
Section: (A)

Max Marks: 80
Duration: 2 hrs.
Date: 16 / 01/2020

Instructions:

- 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.
- Section I is compulsory.
- Attempt any four questions from Section II.
- The intended marks for questions or parts of questions are given in brackets [ ].
- This question paper contains 08 printed pages.

SECTION I- (40 MARKS)
(Attempt all questions from this section)

Question-1

a) Fill in the blanks with the choices given in the brackets- [5]

i) Nonmetals are _____ (oxidizing agents/reducing agents) because they are electron _____ (acceptors/donors).

ii) Higher the pH value of a solution, the more _____ (acidic/ alkaline) it is.

iii) An alkali which could be used to distinguish between a soluble salt of zinc and lead is _____ (sodium hydroxide / ammonium hydroxide)

iv) The number of atoms present in one _____ (mole/molecule) of an element is called it's (acidity/atomicity)

(v) As we descend the electrochemical series containing cations, the tendency of the cations to get _____ (oxidized/reduced) at the cathode increases.

b) Write only balanced chemical equations for the following: [5]

i) Dilute Sulphuric acid is poured over Sodium Sulphite.

ii) Ammonia gas is passed over heated Copper (II) oxide.

iii) Action of heat on a mixture of Copper and concentrated Nitric acid.

iv) A piece of sodium metal is dropped in Ethanol.

v) Zinc granules are added to dilute hydrochloric acid. [5]

c) Arrange the following as per the instruction given in bracket -

i) Ca, Be, Mg (increasing order of number of shells)

ii) Na, Al, Cl (decreasing order of ionization potential)

iii) K^{+}, Cu^{2+}, Fe^{2+} (decreasing order of the preference of discharge at cathode)

iv) Br, F, Cl (increasing order of oxidizing nature)

v) SO_4^{-2} , OH^{-1}, NO_3^{-1} (increasing order of the preference of discharge at anode) [5]

d) Choose the correct answer from the options given below-

i) Hydrogen Chloride gas being highly soluble in the water is dried by:

A) Anhydrous Calcium Oxide.

B) Phosphorous Pentoxide.

C) Quicklime.

D) Conc. Sulphuric acid.

ii) An element reacts with oxygen to give a compound with a high melting point. This compound is also soluble in water. The element is likely to be:

A) Calcium.

B) Carbon.

C) Silicon.

D) Iron.

iii) A particular solution contains molecules and ions of the solute, so it is a-

A) Weak acid.

B) Strong base.

C) Salt solution.

D) Strong acid.

iv) The general formula of an alcohol is:

A) C_nH_{2n}

B) C_nH_{2n-2}

C) C_nH_{2n+2}

D) $C_nH_{2n+1}OH$

v) Ethane, with the molecular formula C_2H_6 has:

A) 6 covalent bonds.

B) 7 covalent bonds

C) 8 covalent bonds

D) 9 covalent bonds

e) Give a reason for each of the following- [5]

i) Lime water test cannot be used to distinguish between Carbon dioxide and Sulphur dioxide.

ii) Carbon tetra chloride which is a liquid, a nonelectrolyte.

iii) Ammonia cannot be collected over water.

iv) Metals are strong reducing agents.

v) Food containing iron salts should not be cooked in Aluminium utensils.

f) Name the following element/compound/process/reaction: [5]

i) A gaseous hydrocarbon commonly used for welding purposes.

ii) Process by which ethane is obtained from ethene.

iii) Distinctive reaction that takes place when ethanol is treated with acetic acid.

iv) The gas produced when excess ammonia reacts with Chlorine.

v) A nitrate which on heating leaves no residue.

g) Match the salts with their correct method of preparation: [5]

S.No.	Salts	S.No.	Prepared by
1	$Pb(NO_3)_2$ from PbO	A	Simple Displacement.
2	$MgCl_2$ from Mg.	B	Titration.
3	$FeCl_3$ from Fe	C	Neutralization.
4	$NaNO_3$ from NaOH	D	Precipitation.
5	$ZnCO_3$ from $ZnSO_4$	E	Combination.

h) **Rewrite the following by inserting appropriate word / words:** [5]

i) During the oxidation of ammonia gas nitric oxide is produced

ii) Lead bromide conducts electricity.

iii) Silver nitrate forms a precipitate on passing hydrogen chloride gas.

iv) A molecule of ammonia has a pair of electrons.

v) Acid salt is formed by partial replacement of the ion of an acid molecule.

SECTION II- (40 MARKS)

(Attempt any four questions from this section)

Question-2

a) Equal lengths of magnesium ribbons are taken in two test tubes labelled 'A' and B'. Dilute acid 'X' is added to test tube 'A' and dilute acid 'Y' is added to test tube 'B' in equal quantities. It is observed that the reaction in test tube 'A' is more vigorous than test tube 'B'.

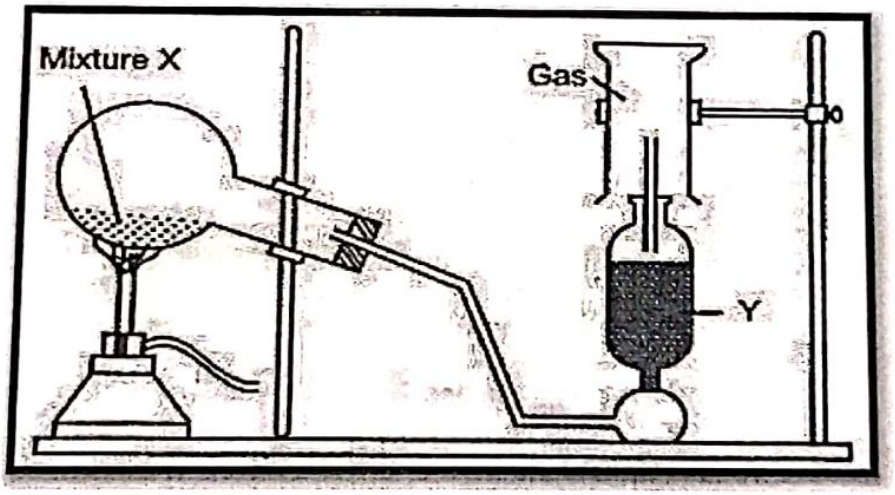
Answer the following questions with respect to this experiment performed. [1+1+2=5]

i) Out of the two acids 'X' and 'Y' taken above which one will have lower hydrogen ion concentration.

ii) Name the gas evolved and a test to identify it's presence.

iii)) What would you observe when baking soda is added to 'X'. Give the reaction involved.

b) **Study the diagram given below and answer the following:** [1X5=5]



i) Identify the gas prepared and collected.

ii) What is the composition of the mixture 'X'?

iii) Name the drying agent 'Y' used.

iv) Why is the round bottom flask kept tilted?

v) Write a balanced chemical equation for the reaction taking place.

[Total marks-10]

Question-3

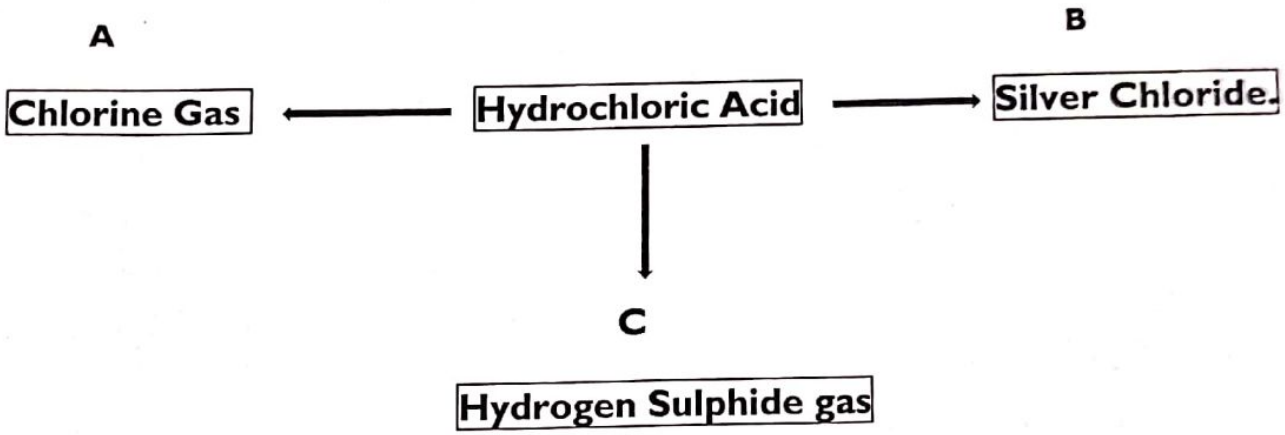
a) How will you distinguish between following pairs of compounds using ammonium Hydroxide. **[2]**

i) Zinc nitrate and lead nitrate.

ii)) Iron (II)sulphate and Iron (III)sulphate.

b) Study the flowchart and give balanced chemical equations with conditions for the conversions. **[3]**

A, B and C.



c) Draw the electron dot structure of the stable positive ion formed when an acid dissolves in water. **[2]**

d) What is the volume occupied by the 44 gram of Carbon dioxide gas at S.T.P? **[1]**

e) How many molecules are present in 16 gram of Sulphur dioxide. [Avogadro's number = $6x10^{23}$] **[2]**

[O=16; C=12; S=32]

[Total marks-10]

Question-4

a) Define the term electrolyte. [1]

b) What do you understand by Denatured alcohol? [1]

c) **Give the I.U.P.A.C name of the following compounds.** [2]

i) Chloroform.

ii) Formaldehyde.

d) **State your observation in each of the following cases:** [3]

i) When moist Starch Iodide paper is introduced into Chlorine gas.

ii) A piece of filter paper soaked in acidified potassium dichromate solution is introduced into a jar of Sulphur dioxide.

iii) Ammonia gas is burnt in an atmosphere of excess oxygen gas.

e) **Give balanced chemical equations for the following conversions:** [3]

i) Ethanol into Ethene:

ii) Sodium Ethanoate to Methane.

iii) Calcium Carbide to Ethyne.

[Total Marks-10]

Question-5

a) Zinc Sulphide when heated in air reacts according to the following equation:

$$2ZnS(s) + 3O_2(g) \longrightarrow 2Zn\,O\,(s) + 2SO_2(g)$$

Calculate:

i) The weight of Zn O formed if 388 g ZnS is heated. [1]

ii) The weight of ZnS required to produce 5.6 liters of SO_2 at S.T.P. [1]

iii) The number of moles of Oxygen required at the same time. [1]

[Zn-65; O=16 and S= 32]

b) Thermal decomposition of Calcium Nitrate takes place as follows:

$$2Ca(NO_3)_2 \longrightarrow 2CaO + 4NO_2 + O_2$$

(i) Calculate the volume of Nitrogen Dioxide obtained at S.T.P. [1]

(ii) Find out the mass of Calcium Oxide formed when 16.4 g of $Ca(NO_3)_2$ is heated. [2]

(Relative molecular mass of $Ca(NO_3)_2$= 164 and of Ca O = 56)

[4]

c) A hydrocarbon X contains 85.7% by weight of C.

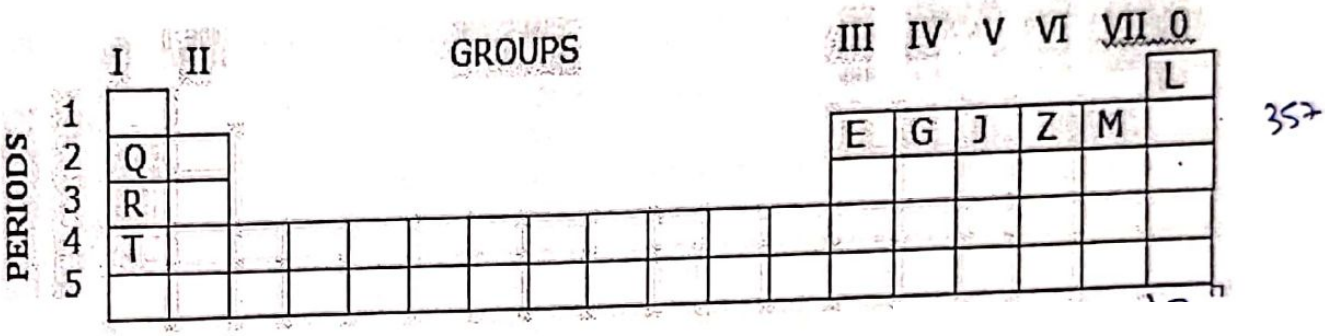
i) Determine the empirical formula. (C=12; H=1)

ii) If molecular mass of X is 28 find its molecular formula.

[Total Marks-10]

Question-6

a) **Use the letters only written in the Periodic Table given below to answer the questions that follow.**



i) State the number of valence electrons in atom J. [1]

ii) Which element shown forms ions with a single negative charge? [1]

iii) Which metallic element is more reactive than R? [1]

iv) Which element has its electrons arranged in four shells? [1]

b) **Identify the term/substance in each of the following:**

i) The tendency of an atom to attract electrons to itself when combined in a compound. [1]

ii) The amount of energy released when an atom in the gaseous state accepts an electron to form an anion. [1]

c) **Write a balanced chemical equation for the preparation of each of the following salts :**

i) Copper (II)carbonate. [1]

ii) Ammonium sulphate crystals. [1]

d) **Draw the structural formula for the following** [2]

i) But-2-ene

ii) Propan-2-ol.

[Total marks-10]

Question-7

a) The following is an extract from" Metals in the Service of Man.-by Alexander and Street- 'Alumina has a very high melting point of over 2000°C so it cannot readily be liquefied. However, conversion of Alumina to Aluminium and Oxygen by electrolysis can occur when it is dissolved in some other substance.

i) Which solution is used to react with Bauxite as a first step in obtaining pure Aluminium Oxide. [1]

ii) Name the element which serves both as the cathode and anode in the extraction of Aluminium. [1]

iii) The Aluminium Oxide for the electrolytic reduction is obtained by heating Aluminium Hydroxide. Write the equation for this reaction. [1]

iv) Write the equation for the reaction that occurs at cathode. [1]

b) **Answer the following with respect to electrolysis of molten lead bromide:**

i) Silica crucible is used as electrolytic cell. Why? [1]

ii) What would you observe at the cathode? [1]

c) **Draw diagram** to show the arrangement used for the absorption of HCl gas in water. [2]

Explain how does this arrangement work? [2]

[Total marks-10]

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