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VIBGYOR HIGH

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Second Preliminary Examination

2018-2019

CHEMISTRY

Grade: X **Max. Marks : 80**

Date : 09/01/2019 **Time Allowed : 2 hours**

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.**
- **The intended marks for the questions or parts of questions are given alongside the questions.**
- **Attempt all questions from Section I and Four questions from Section II, Four out of Six questions.**

SECTION I (40 MARKS)

Attempt all questions from this section

Question 1

a) Choose the most appropriate answer: - **[5]**

(i) A covalent acidic gas which ionizes in solution is

A) NH_3 C) HCl

B) CH_4 D) N_2

(ii) An acid whose salts are always soluble in water is

A) H_2SO_4 C) HCl

B) HNO_3 D) H_2CO_3

(iii) Brass is an alloy of

A) Copper and tin C) Copper and zinc

B) Copper and lead D) Zinc and lead

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(iv) Which of the following is a weak electrolyte?

A) Lithium hydroxide
B) Sodium carbonate
C) Copper chloride
D) Nitric acid

(v) Hydrogen chloride can be obtained by adding concentrated sulphuric acid to

A) Na_2SO_4
B) $MgCl_2$
C) NaCl
D) $CaCl_2$

b) **Name the following: -** [5]

(i) Third member of the alkyne series.

(ii) The most electronegative element from amongst argon, sulphur and chlorine.

(iii) The gas evolved when aluminium reacts with hot and concentrated alkali.

(iv) The property of self-linking of carbon atoms due to which a number of organic compounds are existing.

(v) The soluble salt formed when copper hydroxide dissolves in excess of ammonium hydroxide.

c) **Write a balanced chemical equation for each of the following:** [5]

(i) Preparation of ethane from sodium propionate.

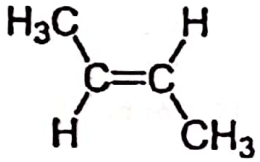
(ii) Catalytic hydrogenation of ethyne.

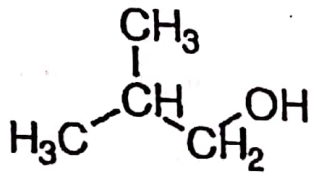
(iii) Oxidation of sulphur by concentrated sulphuric acid.

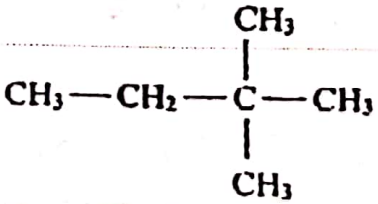
(iv) Reaction of sodium bicarbonate with dilute hydrochloric acid.

(v) Reaction of aqueous solution of ammonia with dilute sulphuric acid.

d) (i) **Give the IUPAC name for each of the following: -** [3]

A) 

B) 

C) 

(ii) **Draw the structural formula of each of the following:-** [2]

A) Prop-1-yne

B) Ethanoic acid.

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e) **State one relevant observation for each of the following: -** [5]

(i) At the anode, when copper sulphate is electrolysed using active electrodes.

(ii) Dilute hydrochloric acid is added to lead nitrate solution and heated.

(iii) A universal indicator is added to a solution of pH value > 12.

(iv) A gas jar filled with hydrogen chloride gas is poured into a jar containing burning candle.

(v) Concentrated sulphuric acid is added to sugar.

f) **Give a reason for each of the following: -** [5]

(i) Methane does not conduct electricity.

(ii) Liquid ammonia is used as a refrigerant.

(iii) In the laboratory preparation of hydrogen chloride gas, quick lime is not used as a drying agent.

(iv) In the electrolysis of acidified water, dilute sulphuric acid is preferred to dilute nitric acid.

(v) Reduction of aluminium oxide to aluminium is done only by electrolysis.

g) (i) $2NH_4Cl + Ca(OH)_2 \longrightarrow CaCl_2 + 2H_2O + 2NH_3$

Calculate the volume of ammonia gas obtained when 267.5 grams of ammonium chloride reacts with calcium hydroxide.

Also calculate the amount of $CaCl_2$ formed.

(N = 14, O = 16, H = 1, Ca=40, Cl = 35.5) [3]

(i) 0.48 grams of a gas forms 100 cc of vapours at STP. Calculate the gram molecular weight of the gas. [2]

h) (i) A) If the molecular formula of an organic compound is C_5H_8, it is

1) Alkane 2) Alkene 3) Alkyne

B) What is denatured alcohol? [2]

(ii) Give reasons for each of the following: [2]

A) During the electrolysis of molten lead bromide, crucible made of silica is used.

B) Solid lead bromide is a non-conductor of electricity.

(iii) Name the salt formed when lead reacts with hot and concentrated potassium hydroxide. [1]

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SECTION II (40 MARKS)

Attempt any 4 questions from this section

Question 2

a) (i) Draw the electron dot diagram to show the formation of hydronium ion. [3]

(ii) Define ionization potential. [1]

b) (i) Arrange the elements Mg, Cl, Na, S, Si in increasing order of atomic size. [1]

(ii) There are three elements A, B and C with atomic numbers 19, 8 and 17. [3]

1) What type of bond is formed between A and C?

2) Write the formula of the compound formed between A and B.

3) Which period does C belong to?

c) Why is hydrogen chloride termed as a polar covalent compound? [2]

Question 3

a) A key chain has to be electroplated with nickel to prevent rusting. [5]

(i) Name the electrolyte.

(ii) Write down the equations for the ionic reactions at the anode and the cathode.

(iii) A direct current and not AC current should be used for the above electroplating. Give a reason.

(iv) State your observation at the anode.

b) The following questions pertain to the laboratory preparation of ammonia. [4]

(i) A higher ratio by weight of the alkali is used. Give a reason.

(ii) Explain why ammonium nitrate is not used in the laboratory preparation.

(iii) The round bottom flask is kept in an inclined position. Give a reason.

(iv) How is the gas collected? State the reason why it is collected in this manner.

c) Name the acid salt formed by the action of sulphurous acid on sodium hydroxide. [1]

Question 4

a) Which of the following methods A, B, C, D or E is generally used for preparing the salts listed below? Each method is to be used only once. Give balanced equation in each case. [5]

A) Displacement.

B) Action of dilute acids on carbonates and bi-carbonates.

C) Neutralization of an alkali (titration).

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D) Precipitation (double decomposition).

E) Direct combination

(i) Calcium chloride
(ii) Iron (II) chloride
(iii) Iron (III) chloride
(iv) Lead (II) chloride
(v) Sodium chloride

b) (i) Name the process used for concentration of bauxite.
(ii) In the above process, name the solution added to bauxite in the first step.
(iii) Write the equation for the reaction in the first step. [3]

c) Draw and name the two chain isomers of the compound with formula C_4H_8. [2]

Question 5

a) The following questions pertain to the large scale manufacture of nitric acid.
(i) Name the process.
(ii) Give balanced equation for the reactions in oxidation chamber and absorption tower.
(iii) In the above process, the catalyst is only initially heated. Give a reason. [4]

b) (i) Define calcination.
(ii) State the principle of hydrolytic method of concentration.
(iii) Name the alloy used in a cooker.
(iv) Copper → Copper nitrate.
Give balanced equation for the conversion using hot dilute nitric acid. [4]

c) (i) Calculate the gram molecules present in 90 g of water (H=1, O= 16).
(ii) Calculate the mass of 100 cc of CO at STP. (C= 12, O=16). [2]

Question 6

a) [4]

Group Number	1	2	13	14	15	16	17	18
	Li	T	D			O	J	
	A	Mg	E	Si		L	M	P

Some elements are in their own symbol and position in the above periodic table and some others are shown with a letter. With reference to the table, state:
(i) How many valence electrons are present in L and P?
(ii) Identify the most electronegative element.
(iii) The most reactive element of group 1.

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b) The following are the properties of concentrated sulphuric acid.

(i) Oxidizing property

(ii) Non-volatile property

(iii) Dehydrating property

Give a balanced equation which is relevant for each of the above properties. [3]

c) 0.5 gram of an organic compound contains 0.062g of hydrogen and 0.25 g of oxygen. In the vapour state this compound weighs 32 times as heavy as the same volume of hydrogen. Determine its molecular formula.[C=12.H=1,O=16] [3]

Question 7

a) **Name the following:-** [5]

(i) The compounds of various metals found in nature along with their earthly impurities.

(ii) The common ore of zinc which is calcined to get the oxide.

(iii) The gas produced on reaction of dilute sulphuric acid with a metallic sulphide.

(iv) The electrolyte used in electroplating an article with silver.

(v) The distinctive reaction that takes place when ethanol is treated with acetic acid.

b) **Differentiate between the following.** [2]

(i) Zinc nitrate and lead nitrate using aqueous ammonia.

(ii) Ammonium hydroxide and sodium hydroxide using copper sulphate solution.

c) The vapour density of a gas is 8. What would be the volume occupied by 32 g of the gas at STP? Also calculate the number of molecules in 32 g of the gas. (Avogadro's number = 6×10^{23}) [3]

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