HIRANANDANI FOUNDATION SCHOOL, THANE

Second Preliminary Examination, January 2019

Subject : Chemistry

STD: X **Time: 2 hrs**

Date :16 /01/2019 **Max. Marks : 80**

Answers to this paper must be written on the paper provided separately.
You will not be allowed to write during the first fifteen 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 paper consists of 5 printed pages.

SECTION I (40 Marks)

Attempt all questions from this section.

Question 1

(a) Choose the most appropriate answer form the options given for each of the following questions: [10]

(i) Propane with molecular formula C_3H_8 has-

A. 7 covalent bonds
B. 9 covalent bonds
C. 8 covalent bonds
D. 10 covalent bonds.

(ii) Which of the following properties are shown by dilute HCl?

1. It turns blue litmus red
2. It turns red litmus blue
3. It reacts with zinc and a gas is evolved.
4. It reacts with sodium carbonate to give a brisk effervescence.

A. 1 and 2
B. 1 and 3
C. 1,3 and 4
D. 2,3 and 4

(iii) Oxidation involves-

A. loss of electrons
B. Gain of elcctrons
C. both A and B
D. none of the above

(iv) Which of the following is an ionic compound?

A. NaCl
B. NH_3
C. CO_2
D. H_2O

(v) The metal present in brass, bronze and german silver is,

A. Cr
B. Mg
C. Cu
D. Al

(vi) Which of the following will weigh the least?

A. 2 gram atoms of nitrogen
B. 1 mole of silver
C. 22.4 litres of oxygen gas at 1 atm pressure and 273 K
D. 6.02×10^{23} atoms of carbon

[Ag=108 ; N = 14; O = 16 ; C = 12]

(vii) Among the elements given below the one with the least electronegaivity is-

A. Lithium
B. Carbon
C. Boron
D. Fluorine

(viii) Heating an ore in a limited supply or absence of air at a temperature just below its melting point is known as -

A. Smelting
B. Ore dressing
C. Calcination
D. Roasting

(ix) Identify the statement that is incorrect about alkanes:

A. They are hydrocarbons
B. They have single covalent bonds between carbon and hydrogen
C. They undergo both addition and substitution reactions
D. On complete combustion, they produce CO_2 and H_2O

(x) Which of the following will act as a nonelectrolyte?

A. liquid carbon tetrachloride
B. Acetic acid
C. Aqueous sodium hydroxide
D. Aqueous potassium chloride

(b) Choose from the following list of substances the one substance in each case which matches the descriptions (i) to (v) given below: [5]

Aluminium nitride, bronze, copper, magnesium, disodium hydrogen phosphate, sulphur dioxide, zinc, methane, sodium sulphate

(i) The molecules of this compound are non-polar.
(ii) This metal does not liberate hydrogen from dilute acids.
(iii) This compound is an acid salt.
(iv) This metal reacts with sodium hydroxide solution liberating hydrogen.
(v) This compound reacts with water and liberates ammonia.

(c) Answer the following questions relating to dilute hydrochloric acid, dilute nitric acid, and dilute sulphuric acid. [5]

(i) Which of these acids will give a precipitate with barium chloride solution?
(ii) Lead nitrate solution is added to each acid. Which of them will not give a precipitate?
(iii) Write balanced chemical equations for the following:

1. Zinc and dilute hydrochloric acid.
2. Sodium hydroxide and dilute sulphuric acid.
3. Copper and dilute nitric acid.

(d) State the type of bonding present in the following molecules: [5]

(i) a non-metallic chloride
(ii) A metallic chloride
(iii) Chlorine molecule.
(iv) Nitrogen molecule.
(v) Hydronium ion.

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(e) Solve the following numericals:

(i) What is the percentage of water in $Na_2S.9H_2O$? [Na=23; S=32 H=1; O=16] [2]

(ii) 112ml of H_2S is mixed with 120ml of Cl_2 at STP. What volume of HCl will be formed, given the equation

$$H_2S + Cl_2 \rightarrow 2HCl + S$$ [2]

(iii) Calculate the mass of 0.4 gram molecules of oxygen[O=16) [1]

(f) Give the branched structural formula for the following: [3]

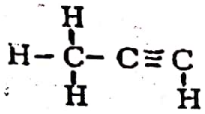
(i) Neo pentane

(ii) Propanoic acid

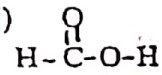
(iii) Methanol

(g) Give the IUPAC names for the following organic compounds: [2]

(i)



(ii)



(h) Match the correct method of preparation given in Column A to the most appropriate chloride in Column B [5]

Column A	Column B
1. The action of an acid on a metal	A. Copper(II) chloride
2. The action of acid on an oxide or a carbonate	B. Iron(III) chloride
3. Direct combination	C. Iron(II) chloride
4. Neutralization of an alkali by an acid	D. Lead(II) chloride
5. Precipitation	E. Sodium chloride

SECTION II(40 marks)

Answer any four questions from this section

Question 2.

(a) Give an equation each to illustrate the following properties of sulphuric acid: [4]

Sulphuric acid acts as:

(i) an acid

(ii) an oxidising agent

(iii) a dehydrating agent

(iv) a less volatile acid

(b) This question is with reference to Group VIIA of the periodic table: [4]

Name:

(i) the solid halogen

(ii) the liquid halogen

(iii) the gaseous halogen having a greenish yellow colour

(iv) the halogen with electronic configuration 2,7.

(c) What do you observe when: [2]

(i) concentrated nitric acid is added to copper

(ii) concentrated sulphuric acid is added to hydrated copper(II) sulphate.

Question 3

(a) Give one chemical test to distinguish between the following pairs of compounds: [3]

(i) zinc sulphate and zinc chloride

(ii) Iron(II) chloride and Iron(III)chloride

(iii) Calcium nitrate solution and calcium chloride solution.

(b) (i) What is the special feature of the apparatus that is used in the laboratory preparation of nitric acid? [1]

(ii) Why should the temperature of the reaction mixture of nitric acid not be allowed to rise above 200°C ? [1]

(c) Ammonia is prepared on a large scale by synthesis: [5]

(i) Name the process.

(ii) State the conditions required for the main reaction of the above process.

(iii) What is the promoter used in the above reaction?

(iv) Write the balanced chemical equation for the above reaction.

(v) State a chemical test for ammonia.

Question 4.

(a) In the periodic table given below, lithium, carbon, oxygen and neon are placed in their correct positions. The positions of eight other elements are represented by letters. These letters are not symbols for the elements concerned.

Group	1	2	13	14	15	16	17	18
	Lithium			Carbon		Oxygen	A	Neon
	X					G	B	
	Y						C	
	Z						D	

Answer the following questions with reference to the above table: [5]

(i) What will be the valency of element X?

(ii) How many shells are present in the atom of G?

(iii) Which is the most reactive metal?

(iv) Amongst X., Y and Z, which is the most metallic?

(v) Amongst A, B, C and D, which has the highest electron affinity?

(b) Answer the following questions with reference to the concentration of aluminium ore by Baeyer's process. [5]

(i) State the common name of the aluminium ore used in the process.

(ii) Write the formula of the above ore.

(iii) Give the balanced chemical equation for the reaction of sodium hydroxide with the above ore.

(iv) State the product obtained as a result of the seeding in the process.

(v) Name the refined aluminium ore obtained at the end of Baeyer'sproces..

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Question 5

(a) The following questions relate to the electroplating of an article with silver: [5]

(i) Name the electrode formed by the article to be electroplated.

(ii) Name the preferred electrolyte that is used.

(iii) State the conditions necessary for the smooth and even deposition of the metal.

(iv) Write the reaction at the cathode

(v) Write the reaction at the anode.

(b) Draw an electron dot diagram to show the formation of an ion from a compound containing two lone pairs. [3]

(c) Name the following: [2]

(i) An ester with a fruity smell

(ii) A substance that reacts with sodium acetate to give a saturated hydrocarbon

Question 6. [5]

(a) Name the following:

(i) A metal whose chloride is soluble in hot water.

(ii) An insoluble calcium salt.

(iii) The functional group in ethanal.

(iv) The process of removal of carbon dioxide from an organic compound.

(v) A salt, which on heating produces a reddish brown gas and a black residue.

(b) Reduction of metallic oxides to the metal can be carried out by- [3]

1. Electrolysis 2. Reducing agents 3. Thermal decomposition

State which of the above methods are used for the following reductions:

(i) Magnesium oxide to magnesium

(ii) Silver oxide to silver

(iii) Ferric oxide to iron.

(c) Differentiate between the following giving one important point of difference: [2]

(i) Ionic and covalent bond

(ii) Hydronium ion and hydroxyl ion

Question 7.

(a) Name the gas evolved when dilute hydrochloric acid is added to: [5]

(i) Magnesium metal

(ii) Calcium carbonate

(iii) Sodium sulphite

(iv) Lead (II) sulphide

(v) Magnesium bicarbonate

(b) Answer the following questions with respect to the compound formed when element Q with atomic number 11 combines with element P having two shells and six valence electrons. [3]

(i) Write its formula

(ii) State the type of bond

(iii) Draw the electron dot structure of the above molecule.

(c) Find the mass of lead formed by reduction of 342.5g of Red lead in the current of hydrogen. [2]
Also, find the volume of hydrogen used up in the reaction. [Pb=207; H=1; O=16]

$$Pb_3O_4 + 4H_2 \rightarrow 3Pb + 4H_2O$$

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