ALLEN CAREER INSTITUTE

PRELIMINARY EXAM : 2019-20

Paper Set : SET-I(HT) | **SUBJECT : Chemistry** | **Max Marks : 80**

ICSE Board - Sample Paper - 1 | **Duration : 2 Hrs.**

Note :
1. Answers to this paper must be written on the paper provided separately.
2. You will not be allowed to write during the first 15 minutes.
3. This time is to be spent in reading the question paper.
4. The time given at the head of the paper is the time allotted for writing the answers.
5. Attempt all questions from Part I (compulsory) and any five questions from Part II, two out of three questions from Section A and three out of five questions from Section B.
6. The intended marks of questions or parts of questions are given in brackets [].

SECTION – 1

Question 1

(a) Fill in the blanks with the correct answer :

1. Inert gases have valency as ..... . (0, 1, 2)
2. A reducing agent gets ..... (oxidised/reduced) during the reaction.
3. ..... (Bases/Acids/Salts) are the chemical compounds which on dissolving in water produce positively charged particles other than hydrogen ions and negatively charged particles other than hydroxyl ions.
4. Hydrogen chloride gas being highly soluble in water is dried by .....
   (Anhydrous calcium chloride/phosphorus pentoxide/concentrated sulphuric acid)
5. Each member of a homologous series differs from the next by $-CH_2$ group or by molecular mass of ..... a.m.u. (12/14/16)

(b) Choose the correct answer from the options given below:

1. Which of the following gases is reddish brown in colour?
   (A) Nitrogen dioxide (B) Sulphur dioxide
   (C) Carbon dioxide (D) Chlorine
2. The general formula for alkyl group is
   (A) C_nH_{2n+2} (B) C_nH_{2n+1} (C) C_nH_{2n+2} (D) C_nH_{2n}
3. Which of the following is true for metals participating in an ionic bond?
   (A) High electron affinity (B) High electronegativity
   (C) Low ionisation potential (D) Both (A) and (B)
5. Which of the following is true for bases ?
   (A) Turns freshly prepared acidified ferrous sulphate solution to brown black.
   (B) Colourless phenolphthalein remains colourless.
   (C) Turns orange colour of methyl to yellow.
   (D) Turns red litmus blue
6. Which of the following salts evolves a brown coloured gas on heating this salt?
   (A) Ferric chloride (B) Calcium nitrate
   (C) Zinc carbonate (D) Magnesium sulphate

(c) Identify the substance underlined, in each of the following cases :

1. A basic oxide.
2. Negative terminal of the cell.
3. A covalent oxide of a metalloid.
4. First member of alkyne homologous series.
5. Gas evolved when sodium carbonate is treated with dilute sulphuric acid.

(d) Write a balanced chemical equation for each of the following :

1. Sodium nitrate and concentrated sulphuric acid.
2. Action of dilute hydrochloric acid on sodium bisulphite.
3. Burning of ethane in excess supply of air.
4. Ethanol is heated with concentrated sulphuric acid.
5. Ammonia is treated with excess of chlorine.

(e) State one relevant observation for each of the following reactions:

1. Ethyne is treated with excess supply of air.
2. Sodium bisulphide is treated with dilute HCl.
3. Excess ammonium hydroxide solution is added to lead nitrate solution.
4. Sodium hydroxide solution is added to ferric chloride solution at first a little and then in excess.
5. Barium chloride solution is added to dilute sulphuric acid.

(f) 1. Draw the structural formula for each of the following :

i. An isomer of n-butane ii. But-2-yne

iii. Acetone

2. Name the main constituent metal in the following alloys:

i. Duralumin ii. Stainless Steel

(g) 1. State Gay Lussac's Law.

2. Calculate the empirical formula of the compound having 37.6% sodium, 23.1% silicon and 39.3% oxygen. (O = 16, Na = 23, Si = 28)

(h) An element 'A' is placed in Group 1 and 3rd period of the periodic table. With reference to element 'A' answer the following questions.

1. Identify element A.
2. How many valence electrons are present in element 'A'?
3. Is element 'A' an oxidizing or a reducing agent?
4. What is the valency of element 'A'?

SECTION-II

Question 2

(a) Answer the following :

1. Arrange the following in the increasing order of their metallic character.
   Cs, Na, Li, K, Rb
2. Why are alkali metals good reducing agents ?
3. What is the trend of ionization potential across a period?
4. State the common feature in the electronic configuration of all the metals of group 2.

(b) Give example of compound or molecule with the following type of bond.

i. Double covalent bond ii. Coordinate bond

(c) You are given the three white powders, calcium carbonate, lead carbonate and zinc carbonate. Describe the tests you would carry out in solution to identify the metal in each of the above compounds.

Question 3

(a) Answer the following :

1. Why do covalent compounds exist as gases, liquids or soft solids?
2. What type of covalent compound is hydrogen chloride? Give reason.
3. Explain the bonding in ethane molecule using electron dot structure.

(b) A person wishes to electroplate an article with nickel. Answer the following :

i. Name the electrolyte
ii. Name the cathode
iii. Name the anode
iv. Give the reaction at cathode
v. Give the reaction at anode.

Question 4

(a) 1. State your observation.

i. When dilute HCl is added to sodium carbonate crystals.
ii. When moist starch iodide paper is introduced into chlorine gas.

2. Answer the following with respect to the manufacture of NH_3 by Haber's process.

i. What are the reactants and in which ratio are they taken ?
ii. Write the chemical reaction for this process.
iii. Name the catalyst and the promoter used in the process.

(b) Give balanced rections for :

i. Dehydration of blue vitriol.
ii. Oxidizing agent for non-metal.
iii. Sulphur dioxide acting as on oxidizing agent.

(c) Write the property of sulphuric acid used in the following reactions.

i. Preparation of hydrogen chloride.
ii. Preparation of copper sulphate from copper oxide.

Question 5

(a) A compound has the following percentage composition of its elements.

C = 12.67%, H = 2.13%, 85.11%

(At. Mass : H = 1, C = 12m Br = 80)

i. Find the empirical formula of the compound.
ii. If the vapour density of the compound is 94, find its molecular formula.

(b) 1. Calculate the mass of calcium that will contain the same number of atoms as are present in 3.2 g of sulphur. (Atomic masses : S = 32, Ca = 40)

2. Calculate the volume of oxygen required for the complete combustion of 8.8 g of propane (C_3H_8).

(Atomic masses : H = 1, C = 12, O = 16)

(c) Name the following :

1. The aqueous salt solution used for testing sulphate radical.
2. If a piece of magnesium is put into a solution which turns blue litmus red, which gas gets evolved?

Question 6

(a) Answer the following :

1. Write chemical equation for the laboratory preparation of nitric acid from potassium nitrate.
2. Give reaction for conversion of nitrogen dioxide to nitric acid.
3. How is dilute nitric acid different from other acids when it reacts with metals?
4. What happens when nitric acid is kept in a reagent bottle for a long time?

(b) Give balanced equations for :

1. Preparation of ethane from sodium propionate.
2. Preparation of ethanol from ethyl chloride.
3. Complete combustion of ethane.
4. Reaction of ethene and water.

(c) What will you observe when :

1. Ethene is passed through bromine solution in carbon tetrachloride.
2. Ethyne is passed through Tollen's formula.

Question 7

(a) Answer the following questions with respect to iron metallurgy :

1. Name the ore of iron and give its formula.
2. Write equations for :
   i. Formation of rust.
   ii. When steam is passed over heated iron.

(b) Name the product at cathode and at anode during the electrolysis of :

1. Dilute hydrochloric acid with inert electrodes.
2. Molten sodium chloride with inert electodes.

(c) Give two differences between roasting and calcination.