

St. Martins High School

Ferozguda, Hyderabad

CLASS: X
Sub: Chemistry

Pre-final I Examination 2008-09

Total Marks: 80
Time: One & half hour

SECTION: I [40 Marks]

Attempt all questions from this section.

Question 1:

- a) Choose from the list of substances one substance in each case, which matches the description (i) to (v) below [Mercury, Bromine, Zinc, Carbon, Acetylene] [5]
- This non-metal is a liquid at room temperature,
 - This metal has a hydroxide which is soluble in sodium hydroxide solution,
 - This non-metal has an allotropic form which conducts electricity,
 - An organic gas which forms red precipitate with Fehling's solution.
 - This metal is a liquid at room temperature.
- b) State one observation each for the following [5]
- Manganese dioxide is heated with concentrated HCl.
 - Silver nitrate solution is added to dilute HCl.
 - Concentrated sulphuric acid is added to sugar crystals.
 - Ethylene is passed through dilute bromine water.
 - Copper sulphate solution is electrolysed using copper electrodes.
- c) Sodium hydroxide solution is added to solutions containing the ions in List 1. List 2 gives the details of the precipitates obtained. Copy and complete the table below to match ions with precipitates [5]

| | List 1 | List 2 |
|----|------------------|-------------------------------|
| 1. | Cu^{2+} | A. White, soluble in excess |
| 2. | Fe^{2+} | B. Reddish brown |
| 3. | Pb^{2+} | C. White, insoluble in excess |
| 4. | Fe^{3+} | D. Blue |
| 5. | Ca^{2+} | E. Dirty green |

| | | | | | |
|--------------|---|---|---|---|---|
| Ions | 1 | 2 | 3 | 4 | 5 |
| Precipitates | | | | | |

- d) Write the names for the following description: [5]
- Positive or negative particle
 - Positive particle
 - Positive electrode
 - Negative particle
 - Negative electrode
- e) Give reasons, why [5]
- Alkenes are more reactive than alkanes,
 - Metals are electropositive in nature,
 - Carbon tetrachloride is a non-electrolyte,
 - Chlorine displaces Iodine from potassium iodide,
 - Bond formed in Hydrogen molecule is non-polar covalent bond.

- f) At room temperature & pressure, 1 mole of SO₂ occupies 24 dm³. At room temp & press, [5]
- What is the mass of 6 dm³ of SO₂?
 - What is the volume occupied by 80g of SO₂?
 - How many moles of SO₂ are present in 96g of it?
 - If one mole of SO₂ contains N molecules, how many molecules are there in 0.64g of SO₂? (Given that S=32, O=16)
 - Calculate the weight of 0.5gram molecules of SO₂?
- g)
- Calculate the volume of O₂ required for the complete combustion of 20cm³ of propane. A complete equation for the reaction is $[C_3H_8 + 5O_2 \longrightarrow 3CO_2 + 4H_2O]$ [1]
 - A compound has the following percentage composition by mass. Carbon 25.41%, Hydrogen 3.17%, Oxygen 33.86% and chlorine 37.56%. Use this data to determine the empirical formula of the compound. (Give the result up to 2 decimal places) given that (H=1, C=12, O=16, Cl=35.5) [4]
- h) Fill in the blanks with appropriate words: [5]
- Iron is extracted from its most common ore _____. Its formula is _____.
 - The two valences exhibited by Iron are _____ & _____.
 - Iron, when reacts with _____, forms anhydrous Iron(III) chloride.

SECTION II [40 Marks]

Attempt any four questions from this section.

Question 2:

- Under suitable conditions steam will react with ethene to produce ethanol. [2]
- Draw the structural formula of [1]
 - Ethene
 - Ethanol.
- What type of organic reactions takes place between ethene and steam? [1]
- Define Isomerism. [2]
- Draw two possible isomeric structures of butane, C₄H₁₀. Choose from letters A to G , the letter corresponding to the term that is required to complete the following sentences:

A. Addition, B. C_nH_{2n+2}, C. C_nH_{2n}, D. Homologous,
E. Catenation, F. Hydrocarbons, G. Carbohydrates. [4]

 - Compounds containing carbon and hydrogen only are called _____
 - A family of organic compounds with the same general formula is known as a _____
 - The general formula of the homologous series alkane is _____
 - Alkenes generally undergo _____ type of reaction.

Question 3

- How many elements are present in 3rd period? [5]
- Arrange the elements of 2nd period in the increasing order of their atomic size.
- Inert gases have zero valence. Why?
- How does ionisation potential differ down the group and across the period?

- e) The volume occupied by 2g of Hydrogen at STP is equal to _____
- f) This volume occupied is called as _____
- g) State Avogadro's law. [2]
- h) Calculate the percentage of Fe in Iron (III) oxide Fe_2O_3 . (O=16, Fe=56) [3]

Question 4:

- a) Name the product at cathode and at anode during the electrolysis of: [5]
- Molten Lead bromide (using inert electrodes).
 - Aqueous solution of Sodium chloride (using inert electrodes).
 - Copper sulphate solution (using inert electrodes)
 - Molten Potassium chloride
 - Molten Magnesium Chloride (inert electrodes)
- b) What type of bonding takes place in the following compounds? [2]
- Sodium chloride, ii) Ammonia, iii) Calcium oxide, iv) Methane
- c) Element A, B, C and D have atomic number 20,8,6,17 respectively. Without identifying the element, answer the following questions: [3]
- What type of bonding is formed and
 - Write the formula of the compound formed between
 - A and B;
 - C and D.

Question 5:

- a) How would you distinguish between Copper oxide and Manganese dioxide by using concentrated Hydrochloric acid only? [2]
- b) Name the experiment that demonstrates extreme solubility of HCl gas. [1]
- c) Write balanced chemical equations for the reaction of dil HCl with: [6]
- Bleaching powder
 - Zinc
 - Silver nitrate solution
 - Sodium carbonate,
 - Iron (II) sulphide
 - Sodium sulphite.
- d) How is Hydrogen chloride gas collected? [1]

Question 6:

- a) Three solutions A, B, C have pH 1,6,13 respectively. [1½]
- Which solution is strongly acidic?
 - Which solution is strongly alkaline?
 - The solution that contains both ions as well as molecules.
- b) Name the acid salt and normal salt of phosphoric acid. [1½]
- c) Write the IUPAC name: [2]
- $\text{H}_3\text{C} - \text{CH} = \text{CH} - \text{CH}_3$
 - $\text{H}_3\text{C} - \text{CHO}$
- d) Write the balanced equation for the preparation of the following: [2]
- Ethyne from calcium carbide.
 - Ethanoic acid from ethane.
- e) Ethylene forms an addition product with chlorine. Name this addition product and write its structural formula. [2]
- f) Name a compound that has vapour density 14 and turns alkaline KMnO_4 green. [1]

Question 7:

- a) Name the most common ore of Aluminium. [1]
- b) Name the process by which ore is purified. [1]
- c) Name the gas liberated at anode during its electrolytic reduction. [1]
- d) Give equations taking place at cathode & at anode. [2]
- e) Name two metallic oxides reduced by carbon. [1]
- f) Name one metallic oxide reduced by carbon monoxide. [1]
- g) Give the balanced chemical equations for the reactions taking place in (e) and (f) [3]