

ICSE Board
Class X Chemistry

Time: 2 hrs

Total Marks: 80

General 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.
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Section I is compulsory.

Attempt any four questions from **Section II**.

The intended marks for questions or parts of questions are given in brackets [].

SECTION I (40 Marks)

*Attempt **all** questions from this section.*

Question 1

a. Name the following: [5]

- i. The gas dissolved in nitric acid to give a pale yellow colour.
- ii. A class of organic compounds having -OH as the functional group.
- iii. A black metallic oxide which dissolves in nitric acid to give a greenish blue solution.
- iv. A solution which reacts with soluble salt of lead to form a yellow precipitate.
- v. Two metallic oxides reduced by aluminium.

b. Complete the following statements: [5]

- i. As we move across a period, _____ increases (atomic size, electron affinity).
- ii. As we move down a group, ____ decreases (metallic character, ionisation potential).
- iii. Inert gases have a complete _____ (octet, triplet).
- iv. Ionisation potential is the energy ____ to remove an electron from a neutral isolated gaseous atom (required/released).
- v. The vertical column in the periodic table is called _____ (group/period).

c. What do you observe when [5]

- i. Ammonia mixes with hydrogen chloride gas
- ii. Ammonium hydroxide is added to zinc nitrate solution, first a little and then in excess
- iii. Concentrated sulphuric acid is added to sugar crystals
- iv. Sulphur dioxide is passed through acidified potassium dichromate solution
- v. Dilute hydrochloric acid is added to sodium carbonate solution

d. The following statements are correct only under certain conditions. Rewrite each statement including the appropriate conditions underlined in your answer: [5]

- i. Hydrogen chloride gas is a covalent compound.
- ii. Ammonia turns red litmus blue.
- iii. Sulphuric acid is the least volatile acid.
- iv. Magnesium reacts with nitrogen to form magnesium nitride.
- v. Hydrogen chloride is soluble in water.

e. Name the following: [5]

- i. Drying agent for ammonia.
- ii. A green-coloured compound is formed when an orange compound is heated.
- iii. An alloy which expands on cooling.
- iv. Metals which exist in the liquid state at room temperature.
- v. Allotropic modification of carbon which conducts electricity.

f. Write the equations for the following reactions: [5]

- i. Aluminium oxide and sodium hydroxide
- ii. Zinc and dilute sulphuric acid
- iii. Magnesium nitride and water
- iv. Concentrated sulphuric acid and sugar
- v. Copper with concentrated nitric acid

g. What is the expected pH of the following solutions? [5]

- i. Solution which turns blue litmus red
- ii. Solution which liberates ammonia from ammonium salts
- iii. Pure water
- iv. Solution which liberates carbon dioxide from metallic carbonate
- v. Ferric chloride solution

h. Name the following: [5]

- i. A metal which is a liquid at room temperature.
- ii. A compound which is added to lower the fusion temperature of the electrolytic bath in the extraction of aluminium.
- iii. The process of heating an ore to a high temperature in the presence of air.
- iv. The compound formed by the reaction between calcium oxide and silica.
- v. The middle region of the blast furnace.

SECTION II (40 Marks)

Attempt **any four** questions from this section.

Question 2

- a. [2]
- Name the compound of lead present in galena.
 - Name the gas obtained when the above named lead compound is roasted.
- b. Define: [2]
- Ore
 - Gangue
- c. Name the process of how [4]
- Aluminium ore is purified (two methods).
 - Molten alumina is reduced.
 - Impure aluminium is purified.
- d. Name the alloy used for making: [2]
- Statues
 - Bodies of aircraft

Question 3

- a. [7]
- Choose from the list only: Ethyne, Ethane, Ethene, Nickel, Copper, Saturated, C_nH_{2n-2} , C_nH_{2n} , C_nH_{2n+2} , Unsaturated, Saturated, Fehling's solution, Colourless, Addition

$CH_2=CH_2$ is (i) _____. It is (ii) _____ hydrocarbon having the general formula (iii) _____. Ethene reacts with the solution of bromine in carbon tetrachloride to give (iv) _____ solution and it undergoes (v) _____ reaction. Addition of hydrogen to $CH_2=CH_2$ yields (vi) _____ in the presence of (vii) _____ as a catalyst.

- b.
- Give balanced chemical equations for the reactions mentioned in the above question. [2]
 - What special feature in $CH_2=CH_2$ helps to bring about the change of bromine solution in carbon tetrachloride? [1]

Question 4

a.

- i. What changes will you observe at the cathode, the anode and in the electrolyte during the electrolysis of copper sulphate solution with copper electrode? [3]
- ii. Give equations taking place at the cathode and at the anode in the above reaction.[2]

b. Give the appropriate terms for the following: [5]

- i. The number of atoms present in 1 molecule of an element.
- ii. A formula of a chemical substance which represents the actual number of atoms of each element present in its one molecule.
- iii. The number of atoms which represents how many times one molecule of a substance is heavier than one atom of hydrogen.
- iv. It is one-twelfth the mass of $^{12}\text{C}_6$.
- v. Hydrated hydrogen ion.

Question 5

a. [3]

- i. Name the process by which ammonia is prepared from its elements.
- ii. Write the equation of manufacturing of ammonia.
- iii. Which property of ammonia is demonstrated by the fountain experiment?

b. [4]

When ammonium salts (like ammonium chloride) is heated with an alkali (say sodium hydroxide), it produces gas 'A'. With reference to certain properties of gas 'A', answer the following questions:

- i. Identify gas 'A'.
- ii. Write the balanced chemical equation for the reaction which produces gas 'A'.
- iii. How is gas 'A' collected and dried?
- iv. What is the nature of gas 'A'?

c. Fill in the blanks from the choices given below: [3]

- i. Down the group, the electron affinity _____ (increases, decreases, remains the same).
- ii. A molecule of _____ contains a triple bond (hydrogen, ammonia, nitrogen).
- iii. Electrovalent compounds have _____ (low/high) boiling point.

Question 6

- a.** Three solutions A, B and C have pH 1, 6 and 13, respectively. [3]
- Which solution is strongly acidic?
 - Which solution is strongly alkaline?
 - Which solution is least acidic?
- b.** Name the type of bond formed with reason between [4]
- Metal and non-metal
 - Non-metal only
- c.** [3]
- Name the elements present in the first period.
 - Name two transition elements.
 - State the modern periodic law. Which elements in Group 1 and Group 17 are likely to be metallic in nature?

Question 7

- a.** [2]
Name the process by which sulphuric acid is manufactured. Write a balanced chemical equation for the reaction which takes place in the presence of a catalyst.
- b.** Give one equation for each to show that sulphuric acid acts as [3]
- Oxidising agent
 - Dehydrating agent
 - Least volatile acid
- c.** [5]
Alkenes have general formula (i) _____ (C_nH_{2n+2} , C_nH_{2n}). Alkenes are the (ii) _____ (analogous/homologous) series of (iii) _____ (saturated/unsaturated) hydrocarbons. They differ from alkanes due to the presence of (iv) _____ (double/single) bonds. Alkenes mainly undergo (v) _____ (addition/substitution) reactions.