

ICSE Board
Class X Chemistry
Sample Paper - 1

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.

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]

- A green-coloured compound formed when an orange compound is heated.
- An insoluble salt obtained when sulphur dioxide is passed through lime water.
- Drying agent for ammonia.
- Essential product formed when hydrogen sulphide solution reacts with an oxidising agent.
- The process by which a thin coating of zinc is made over the surface of iron.

b. Certain pairs of substances from the list given below react together to give salts. Choose the correct pair of substances and write only the balanced chemical equation for the laboratory preparation of salts.

List: Zinc, iron, chlorine, sulphur, copper oxide, copper, dilute sulphuric acid, barium chloride, sodium carbonate, magnesium chloride

[5]

- Zinc sulphate
- Copper sulphate
- Magnesium carbonate
- Iron (III) chloride
- Iron (II) sulphide

c. Write balanced chemical equations for the following reactions: [5]

- i. Sulphur reacts with concentrated nitric acid.
- ii. Phosphorus reacts with concentrated nitric acid.
- iii. Copper reacts with concentrated nitric acid.
- iv. Zinc reacts with cold and dilute nitric acid.
- v. Hydrochloric acid mixed with nitric acid

d. Copy and complete the following table showing the trends of the various periodic properties. [5]

Periodic property	Group	Period
(1) Ionisation energy	(i) _____	(ii) _____
(2) Electron affinity	(iii) _____	(iv) _____
(3) Electronegativity	(v) _____	(vi) _____
(4) Atomic size	(vii) _____	(viii) _____
(5) Reducing property	(ix) _____	(x) _____

e. What do you observe when [5]

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

f. Name the products obtained at the cathode and at the anode during the electrolysis of [5]

- i. Molten lead bromide (inert electrodes)
- ii. Aqueous solution of sodium chloride (inert electrodes)
- iii. Copper sulphate solution (inert electrodes)
- iv. Molten sodium chloride
- v. Molten potassium chloride

g. What type of bonding takes place in the following compounds? [5]

- i. Sodium chloride
- ii. Carbon tetrachloride
- iii. Ammonia
- iv. Methane
- v. Calcium oxide

- h.** The following statements are correct only under certain conditions. Rewrite each statement including the appropriate conditions underlined in your answer: [5]
- Hydrogen chloride gas is a covalent compound.
 - Ammonia turns red litmus blue.
 - Sulphuric acid is the least volatile acid.
 - Magnesium reacts with nitrogen to form magnesium nitride.
 - Hydrogen chloride is soluble in water.

SECTION II (40 Marks)

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

Question 2

- a.** [5]
- During the electrolysis of silver over a copper spoon, the electrolyte used must contain (1) _____ ions. The (2) _____ hung at the cathode (3) _____ is made the anode. The anode is (4) _____ in nature.
 - Give the equations taking place at the cathode and at the anode during the electroplating of silver over a copper spoon.
- b.** [3]
- LPG stands for liquefied petroleum gas. Varieties of LPG are marketed including a mixture of propane (60%) and butane (40%). If 10 litres of this mixture is burnt, find the total volume of carbon dioxide gas added to the atmosphere.
The combustion reaction can be represented as

$$\text{C}_3\text{H}_8(\text{g}) + 5\text{O}_2(\text{g}) \rightarrow 3\text{CO}_2(\text{g}) + 4\text{H}_2\text{O}(\text{g})$$

$$2\text{C}_4\text{H}_{10}(\text{g}) + 13\text{O}_2(\text{g}) \rightarrow 8\text{CO}_2(\text{g}) + 10\text{H}_2\text{O}(\text{g})$$
 - Calculate the percentage of nitrogen and oxygen in ammonium nitrate [Relative molecular mass of ammonium nitrate is 80, H = 1, N = 14, O = 16]. [2]

Question 3

- a.** [4]
- Name the compound of lead present in galena.
 - Name the gas released when the above named lead compound is roasted.
 - Name the process used for refining of metals such as lead and tin.
 - Name the carbonate ore of zinc.
- b. Define:** [3]
- Ore
 - Gangue
 - Flux

- c. Name the process by which [3]
- Aluminium ore is purified.
 - Molten alumina is reduced.
 - Impure aluminium is purified.

Question 4

- a. Write balanced chemical equations for the following reactions: [4]
- The laboratory preparation of methane from sodium acetate.
 - The industrial preparation of methanol from water gas.
 - The reaction of one mole of ethene with one mole of chlorine gas.
 - The preparation of ethyne from 1,2-dibromoethane.
- b. State how the following conversions can be carried out: [4]
- Ethyl chloride to ethyl alcohol
 - Ethyl chloride to ethene
 - Ethene to ethyl alcohol
 - Ethyl alcohol to ethene
- c. i. Define isomerism.
- ii. Give the IUPAC name of the isomer C_4H_{10} which has a branched chain. [2]

Question 5

- a. Write observations and balanced equations for the following reactions: [5]
- Sodium hydroxide is added dropwise till in excess to a solution of zinc sulphate.
 - Ammonium hydroxide is added first in a small quantity and then in excess to a solution of copper sulphate.
- b. Give reasons for the following with reference to electroplating: [5]
- The metal to be plated on the article is always made the anode.
 - The electrolyte must contain the ions of metals with which the article has to be electroplated.
 - Low current for longer time should be used.
 - DC is always preferred.

Question 6

- a.** [3]
- What do you understand by a lone pair of electrons?
 - Draw the electron dot diagram of hydronium ion. (H = 1; O = 8)
- b.** In Period 3 of the periodic table, element B is placed to the left of element A. On the basis of this information, choose the correct word from the brackets to complete the following statements: [3]
- Element B would have (lower/higher) metallic character than A.
 - Element A would probably have (lesser/higher) electron affinity than B.
 - Element A would have (greater/smaller) atomic size than B.
- c.** Copy and complete the following table which refers to the conversion of ions to neutral particles. [4]

Conversion	Ionic Equation	Oxidation/Reduction
Chloride ion to chlorine molecule	(i)	(ii)
Lead (II) ion to lead	(iii)	(iv)

Question 7

- a.** [5]
- How is sulphur dioxide obtained from sodium sulphite and copper chips? Give balanced chemical equations only.
 - Name the acid formed when sulphur dioxide is dissolved in water.
 - What are the salts of the above named acids called?
- b.** The following questions are related to dilute hydrochloric acid: [5]
- What is the basicity of hydrochloric acid?
 - Name two metallic nitrates which react with dilute hydrochloric acid to give white precipitate.
 - Name the gas liberated when dilute hydrochloric acid reacts with active metals.