

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. From the list given below, select the word(s) required to correctly complete the blanks (i) to (v) in the following passage: [5]

Note: Words chosen from the list are to be used only once. Write only the answers, do not copy the passage.

[Reddish brown, ammonium, nitrogen dioxide, hydroxyl, dirty green, ammonia, acidic, alkaline]

Nitrogen and hydrogen combine in the presence of a catalyst to give (i) _____ gas. When the above mentioned gas is passed through water, it forms a solution which will be (ii) _____ in nature, and the solution contains (iii) _____ ions and (iv) _____ ions. The above solution gives a (v) _____-coloured precipitate of iron (II) hydroxide.

- b. Select from the list given (a to e) one substance in each case which matches the description given in parts (i) to (v). [5]

(Note: Each substance is used only once in the answer.)

- (a) Nitroso iron (II) sulphate
- (b) Iron (III) chloride
- (c) Chromium sulphate
- (d) Lead (II) chloride
- (e) Sodium chloride

- i. A compound which is deliquescent.
 - ii. A compound which is insoluble in cold water but soluble in hot water.
 - iii. The compound responsible for the brown ring during the brown ring test of nitrate ion.
 - iv. A compound whose aqueous solution is neutral in nature.
 - v. The compound which is responsible for the green coloration when sulphur dioxide is passed through acidified potassium dichromate solution.
- c. For part (c) (i)–(c) (v), select the correct answers from the choices A, B, C and D which are given. [5]

Write only the letter corresponding to the correct answer.

- i. A particular solution contains molecules and ions of the solute, so it is a
 - (a) Weak acid
 - (b) Strong acid
 - (c) Strong base
 - (d) Salt solution
- ii. A compound which liberates reddish brown gas around the anode during electrolysis in its molten state is
 - (a) Sodium chloride
 - (b) Copper (II) oxide
 - (c) Copper (II) sulphate
 - (d) Lead (II) bromide
- iii. An organic compound undergoes addition reactions and gives a red colour precipitate with ammoniacal cuprous chloride. Therefore, the organic compound could be
 - (a) Ethane
 - (b) Ethene
 - (c) Ethyne
 - (d) Ethanol
- iv. An organic weak acid is
 - (a) Acetic acid
 - (b) Sulphuric acid
 - (c) Nitric acid
 - (d) Hydrochloric acid
- v. The metal which is a liquid at room temperature is
 - (a) Sodium
 - (b) Magnesium
 - (c) Mercury
 - (d) Silver

- d.** State your observation for the following cases: [5]
- Moist blue litmus is introduced into a gas jar of sulphur dioxide.
 - Dry red rose petals are placed in a jar of sulphur dioxide.
 - Paper soaked in potassium permanganate solution is introduced into a gas jar of sulphur dioxide.
 - Ammonia gas is burnt in an atmosphere of oxygen in the absence of a catalyst.
 - A glass rod dipped in ammonium hydroxide is brought near the mouth of a concentrated hydrochloric acid bottle.

- e.** Match **Column A** with **Column B**. [5]

Column A	Column B
(i) Sodium chloride	Increases
(ii) Ammonium ion	Covalent bond
(iii) Electronegativity across the period	Ionic bond
(iv) Non-metallic character down the group	Covalent and coordinate bond
(v) Carbon tetrachloride	Decreases

- f.** Write correctly balanced equations for the following reactions: [5]
- Burning of a candle in chlorine.
 - Between nitrogen and oxygen when lightning strikes.
 - Calcium carbide is heated in a current of nitrogen.
 - Action of heat on sodium nitrate.
 - Action of heat on aluminium hydroxide.

- g.** Name the following: [5]
- Non-metal, good conductor of electricity
 - Liquid non-metal
 - Metal used for galvanisation
 - A yellow non-metal
 - Atomicity of metals

- h.** Name the gas evolved in each case: [5]
- The gas produced by the action of concentrated sulphuric acid on sodium chloride.
 - The gas produced by the action of dilute nitric acid on copper.
 - The gas produced on heating sodium nitrate.
 - The gas which burns in oxygen with a green flame.
 - The gas which can be oxidised to sulphur.

SECTION II (40 Marks)

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

Question 2

- a. The questions below are related to the manufacture of ammonia. [5]
- Name of the process.
 - In what ratio must the reactants be taken?
 - Name the catalyst used.
 - Give the equation for the manufacture of ammonia.
 - Ammonia can act as a reducing agent. Write a relevant equation for such a reaction.
- b. Write the equation for the reaction of zinc with each of the following: [3]
- NaOH
 - Dilute H_2SO_4
 - CuSO_4
- c. [2]
- A thin layer of zinc is used to protect iron. Name the process.
 - Name a non-metal having metallic lustre which sublimes on heating.

Question 3

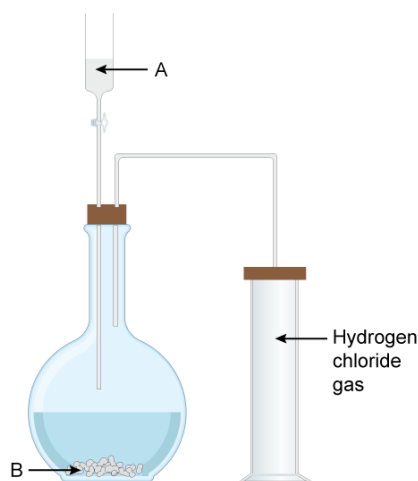
- a. Mr Ramu wants to electroplate his keychain with nickel to prevent rusting. For the electroplating process, [5]
- Name the electrolyte used
 - Name the cathode used
 - Name the anode used
 - Give the reaction at the cathode
 - Give the reaction at the anode
- b. Define electroplating. State the reasons for electroplating. [3]
- c. [2]
- A polar covalent compound formed between hydrogen and halogen in Period 2 of the periodic table.
 - The most metallic element in Period 3.

Question 4

a. [5]

The diagram shows an apparatus for the laboratory preparation of hydrogen chloride:

- Identify A and B.
- Write the equation for the reaction.
- How would you check whether the gas jar is filled with hydrogen chloride?
- What does the method of collection tell you about the density of hydrogen chloride?



b. The following questions refer to the extraction of aluminium: [5]

- Name the process by which aluminium is extracted.
- Name the ore of aluminium used.
- What is the function of cryolite in the electrolyte?
- Why is it necessary to replace the anode after some time?
- Write the reaction taking place at the cathode.

Question 5

a. The following questions are related to iron: [3]

- Name the acid with which iron is rendered passive.
- Name an alloy of iron and carbon.
- Name the process by which iron ore is concentrated.

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

- Monochloroethane is hydrolysed with aqueous KOH.
- A mixture of soda lime and sodium acetate is heated.
- Ethanol under high pressure and low temperature is treated with acidified potassium dichromate.
- Water is added to calcium carbide.
- Ethanol reacts with sodium at room temperature.

c. What happens to the crystals of washing soda when exposed to air? Name the phenomenon exhibited. [2]

Question 6

a. Name the organic compound prepared by each of the following reactions: [5]

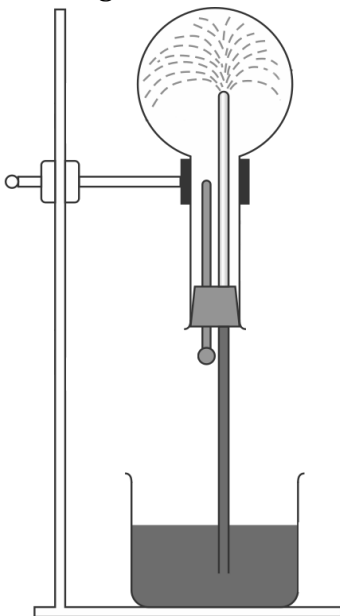
- i. $\text{C}_2\text{H}_5\text{COONa} + \text{NaOH} \rightarrow$
- ii. $\text{CH}_3\text{I} + 2\text{H} \rightarrow$
- iii. $\text{C}_2\text{H}_5\text{Br} + \text{KOH}$ (alcoholic solution) \rightarrow
- iv. $\text{CO} + 2\text{H}_2 \xrightarrow{\text{ZnO}}$
- v. $\text{CaC}_2 + 2\text{H}_2\text{O} \rightarrow$

b. Alloys are used instead of the metal for certain reasons. Write the reason for each of the following: [5]

- i. Solder is used instead of lead.
- ii. Duralumin is used instead of aluminium.
- iii. Stainless steel is used instead of iron.
- iv. Brass is used instead of copper.
- v. Bronze is used instead of copper.

Question 7

a. The diagram shows a simple arrangement of the fountain experiment [5]



- i. Name the two gases you have studied which can be used in this experiment.
- ii. What is the common property demonstrated by this experiment?
- iii. Name the reaction when the aqueous solutions of both gases react.
- iv. What are the products formed in the neutralisation reaction?
- v. Neutralisation is also known as_____.

- b.** The following questions refer to the modern periodic table: [5]
- i. What are Group I A and IIA elements commonly called?
 - ii. Group VIIA elements are known as halogens, why?
 - iii. What is the valency of elements in Group VIII?
 - iv. Name two elements in Group VIII which are different from the rest of the group elements.
 - v. Lithium and beryllium although belonging to different groups are found to have similar chemical properties. What is the common name used to represent such similarities?