

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.
-

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

[5]

a. Name the following (Formula not acceptable):

- i. A white solid used for drying ammonia.
- ii. The solution which is used for the preparation of ethene from ethyl bromide.
- iii. An organic gas which forms a red precipitate with Fehling's solution.
- iv. A black metallic oxide which dissolves in nitric acid to give a greenish blue solution.
- v. A solution which reacts with a soluble salt of lead to form a yellow precipitate.

b. Write balanced chemical equations for the following:

[5]

- i. Solution of bromine in carbon tetrachloride is treated with acetylene.
- ii. Iron pyrite is roasted.
- iii. Copper chips are treated with concentrated sulphuric acid.
- iv. Ammonia is mixed with pure oxygen.
- v. Sulphur dioxide is passed through hydrogen sulphide solution.

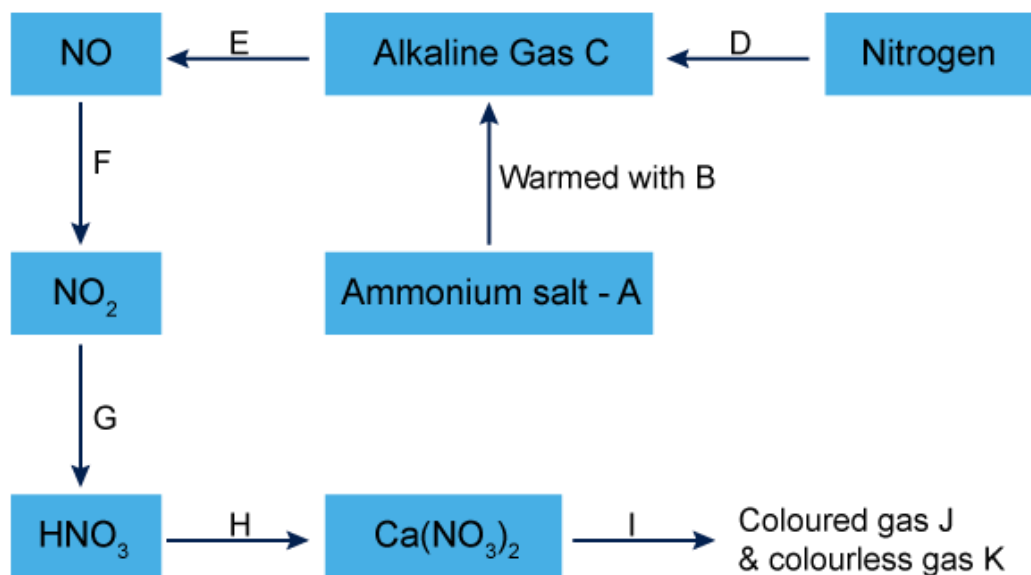
c. Fill in the blanks with appropriate words:

[5]

Iron is extracted from its most common ore (i) _____. Its formula is (ii) _____. The two valencies exhibited by iron are (iii) _____ and (iv) _____. Iron when reacts with (v) _____ forms anhydrous iron (III) chloride.

- d.** State what you will observe when [5]
- Sulphur dioxide is passed through hydrogen sulphide solution.
 - Ammonium hydroxide is slowly added to copper sulphate solution, first a little and then in excess.
 - Sodium hydroxide is slowly added to iron (III) chloride solution.
 - Sodium hydroxide is added to zinc sulphate solution.
 - Barium chloride solution is mixed with sodium sulphate solution.

- e.** Give equations for the reactions taking place in (D) above. [5]



- Identify A, B, C, J and K.
- How are the conversions D, E, F, G, H and J carried out?

- g.** [5]

- How many elements are present in the 3rd period?
 - Arrange the elements Li, B, F, Be, O, N and C of the 2nd period in the increasing order of their atomic size.
 - Inert gases have zero valency. Why?
- How does ionisation potential differ in group and period?

- h.** Name the organic compound prepared by each of the following reactions: [5]

- $\text{C}_2\text{H}_5\text{COONa} + \text{NaOH} \longrightarrow$
- $\text{CH}_3\text{I} + 2[\text{H}] \longrightarrow$
- $\text{C}_2\text{H}_5\text{Br} + \text{KOH (alcoholic solution)} \longrightarrow$
- $\text{CO} + 2\text{H}_2 \xrightarrow{\text{ZnO}}$
- $\text{CaC}_2 + 2\text{H}_2\text{O} \longrightarrow$

SECTION II (40 Marks)

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

Question 2

- a.** [3]
- i. Name the products formed at the cathode and at the anode during the electrolysis of the following with inert electrodes.
1. Molten lead bromide
 2. Acidulated water
 3. Dilute HCl
- ii. Give applications of electrolysis.
- b.** [2]
- i. $\text{AgNO}_3 + \text{NaCl} \rightarrow \text{AgCl} + \text{NaNO}_3$
How many grams of silver nitrate are required to precipitate 287 g of silver chloride?
(N = 14, O = 16, Cl = 35.5, Ag = 108)
- ii. If a compound has empirical formula CH_2O and its molecular mass is 180, then calculate its molecular formula.

Question 3

- a.** From the list of characteristics given below, select the five which are relevant to non-metals and their compounds: [5]
- A. Ductile
 - B. Conduct electricity
 - C. Brittle
 - D. Acidic oxides
 - E. Basic oxides
 - F. Discharged at the anode
 - G. Discharged at the cathode
 - H. Ionic chlorides
 - I. Covalent chlorides
 - J. Reaction with dilute sulphuric acid yields hydrogen
 - K. 1, 2 or 3 valence electrons
 - L. 5, 6 or 7 valence electrons
- (Write the five letters corresponding to the correct characteristics)

b. Aluminium is extracted from its chief ore bauxite. The ore is first purified, and then the metal is extracted from it by electrolytic reduction. [5]

- i. Write three balanced chemical equations for the purification of bauxite by the Hall's process.
- ii. Name a chemical used for dissolving aluminium oxide. In which state of sub-division is the chemical used?
- iii. Write an equation for the reaction which takes place at the anode during the extraction of aluminium by the electrolysis process

Question 4

a. Compound A is bubbled through bromine dissolved in carbon tetrachloride and the product is $\text{CH}_2\text{Br}-\text{CH}_2\text{Br}$. [5]



- i. Draw the structural formula of A.
- ii. What type of reaction has A undergone?
- iii. What is your observation?
- iv. Name (not formula) the compound formed when steam reacts with A in the presence of phosphoric acid.
- v. What is the procedure for converting the product of (iv) back to A?

b. [5]

- i. The volume occupied by 2 g of hydrogen at STP is equal to (1) _____. This volume occupied is called (2) _____ volume.
- ii. State Avogadro's law.
- iii. How many moles are present in 10 grams of calcium carbonate?
(C = 12, O = 16, Ca = 40)

Question 5

a. What is the difference between [2]

- i. An alkali and a base
- ii. The chemical nature of an aqueous solution of HCl and an aqueous solution of NH_3

b. Using sodium hydroxide solution, how would you distinguish [3]

- i. Zinc nitrate solution and calcium nitrate solution
- ii. Iron (II) chloride from iron (III) chloride

c. What property of sulphuric acid is shown by the reaction of concentrated sulphuric acid when heated with [2]

(A) Potassium nitrate (B) Carbon

- d.** State one observation for each of the following: [3]
- A zinc granule is added to copper sulphate solution.
 - Zinc nitrate crystals are strongly heated.

Question 6

- a.** Name two salts each which on dissolving in water produces [2]
- Acidic solution
 - Basic solution

- b.** Identify the following reactions as either oxidation or reduction. [3]
- $O + 2e^- \rightarrow O^{2-}$
 - $K - e^- \rightarrow K^+$
 - $Fe^{3+} + e^- \rightarrow Fe^{2+}$

- c.** [5]
- Name the first and the last element of Period 2.
 - What happens to the atomic size of elements moving from top to bottom of a group?
 - Which of the elements has the greatest electron affinity among the halogens?
 - What is the common feature of the electronic configuration of the elements in Group 7?

Question 7

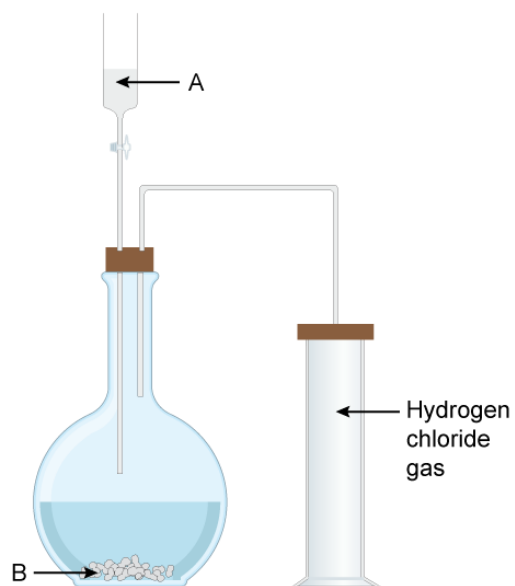
- a.** Some properties of sulphuric acid are listed below. Choose the property A, B, C or D which is responsible for the reactions (i) to (v). Some properties may be repeated: [5]

- A. Acid
B. Dehydrating agent
C. Non-volatile acid
D. Oxidising agent

- $C_{12}H_{22}O_{11} + nH_2SO_4 \longrightarrow 12C + 11H_2O + nH_2SO_4$
- $S + 2H_2SO_4 \longrightarrow 3SO_2 + 2H_2O$
- $NaCl + H_2SO_4 \longrightarrow NaHSO_4 + HCl$
- $CuO + H_2SO_4 \longrightarrow CuSO_4 + H_2O$
- $Na_2CO_3 + H_2SO_4 \longrightarrow Na_2SO_4 + H_2O + CO_2$

b. The diagram shows the apparatus for the laboratory preparation of hydrogen chloride.

[5]



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