

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.** The following questions are related to the properties and uses of gases. Name the gas which [5]
- i. Is basic in nature
 - ii. Has burning sulphur smell
 - iii. Has rotten egg smell
 - iv. Gives white precipitate with silver nitrate solution
 - v. Turns Nessler's reagent brown
- b.** The following questions are related with the properties and uses of metals and non-metals: [5]
- i. Bonding present in metallic chlorides
 - ii. Bonding present in non-metallic chlorides
 - iii. During electrolysis, metals are obtained at which electrode?
 - iv. During electrolysis, non-metals are liberated at which electrode?
 - v. Property by which metals can be beaten to sheets
- c.** Name the organic compounds which can fit into the description given below: [5]
- i. A carboxylic acid containing two carbon atoms
 - ii. Hydrocarbon containing at least one carbon-carbon single bond
 - iii. Hydrocarbon containing at least one carbon-carbon double bond
 - iv. Hydrocarbon containing at least one carbon-carbon triple bond
 - v. Hydrocarbon which contributes towards the greenhouse effect

d. Name the property in each case: [5]

- i. Salts when exposed to the atmosphere absorb moisture and become wet.
- ii. The unique property by which elements link to each other either to form a long chain or ring structure.
- iii. The property by which metals can be drawn into wires.
- iv. Salts, when exposed to the atmosphere, absorb moisture and get converted to their saturated solution.
- v. Hydrated salts, when exposed to the atmosphere, lose their water of crystallisation and crumble to form powder.

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

- i. Lead nitrate is heated.
- ii. Nitric oxide is oxidised.
- iii. Red hot iron reacts with sulphuric acid.
- iv. Ammonia reacts with sulphuric acid.
- v. Nitric acid is heated.

f. Calculate:

- i. Number of moles occupied by 32 g of sulphur dioxide. [1]
- ii. Number of molecules occupied by 32 g of sulphur dioxide. [1]
- iii. Volume occupied by 32 g of sulphur dioxide at STP. [2]
- iv. If gas 'X' has relative molecular mass as 44, then what is its vapour density? [1]

g. Name the gas evolved when [5]

- i. Calcium carbide is hydrolysed.
- ii. Aluminium carbide is hydrolysed.
- iii. Ammonium chloride is warmed with caustic soda.
- iv. Ethene is hydrogenated.
- v. Ammonium nitrate is heated.

h. Write balanced chemical equations: [5]

- i. Calcium carbide is hydrolysed.
- ii. Aluminium carbide is hydrolysed.
- iii. Ammonium chloride is warmed with caustic soda.
- iv. Ethene is hydrogenated.
- v. Ammonium nitrate is heated.

SECTION II (40 Marks)

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

Question 2

[4]

a.

S. No.	Name of Electrolyte	Name of Cathode	Name of Anode	Product at Cathode	Product at Anode
1.	CuSO ₄	Copper	Copper		
2.	PbBr ₂ (molten)	Platinum	Platinum		

b. Select the correct answer from the choices A, B, C and D which are given.

During the electrolysis of molten lead bromide, which of the following takes place?
Also provide the overall chemical reaction for the above.

- A. Bromine is released at the cathode.
- B. Lead is deposited at the anode.
- C. Bromine ions gain electrons.
- D. Lead is deposited at the cathode.

[2]

c. A compound has the following percentage composition by mass:

Carbon – 54.55%, Hydrogen – 9.09% and oxygen – 36.26%. Its vapour density is 44.

Find the empirical and molecular formula of the compound.

(H = 1; C = 12; O = 16)

[2]

d. State whether the following statements are True or False:

[2]

- i. Carbon dioxide is a neutral oxide.
- ii. Acetic acid is a tribasic acid.

Question 3

[6]

a. Match the following:

- i. Duralumin (a) Shells of ammunition rounds
- ii. Brass (b) Aircraft frames
- iii. Bronze (c) Joining electrical circuits
- iv. Solder (d) Coins
- v. Magnalium (e) Cutlery
- vi. Stainless steel (f) Scientific instruments

b.

[4]

- i. Name the carbonate ore of zinc.
- ii. Name the zinc compound 'A' formed when the above named ore is heated.
- iii. Name the process by which the zinc compound 'A' is formed from carbonate ore.
- iv. Name the reducing agent used during the process and write the balanced chemical equation.

Question 4

- a.** Give the structural formula for [3]
- Ethane
 - Ethene
 - Ethyne
- b.** Which out of ethene and ethyne reacts with Fehling's solution and Tollens' reagent? [2]
- c.** Give balanced chemical equations for the following reactions: [5]
- Aluminium carbide is hydrolysed.
 - Sodium acetate is decarboxylated.
 - Ethanol is dehydrated.
 - Ethyl bromide is reduced.
 - Ethanol reacts with ethanoic acid in the presence of concentrated sulphuric acid.

Question 5

- a.** Name the method by which following compounds can be prepared. Select the appropriate method from the following list: [3]
Neutralisation, direct combination, precipitation, metal + acid
Use a method only once.
- Sodium sulphate
 - Silver chloride
 - Iron sulphide
- b.** In Ostwald process, catalytic oxidation of ammonia is carried out. [5]
- Name the product manufactured by this process.
 - What is the ratio in which the reactant mixture is taken?
 - Write the reaction for the catalytic oxidation of ammonia.
 - Suggest one method to remove the yellow colour.
 - Though pure acid is colourless, the sample prepared is slightly coloured, why?
- c.** Write one use of each: [2]
- Alcohol as a solvent
 - Silver salt in photography

Question 6

[2]

a. Solution P has a pH of 13, solution Q has a pH of 6 and solution R has a pH of 2.

- i. Which solution will liberate ammonia from ammonium sulphate?
- ii. Which solution contains solute molecules as well as ions?

b. Give the electron dot structure of the following:

[3]

i. NH_3

ii. CH_4

iii. H_3O^+

c.

[5]

- i. Write the formula of the sulphate of the element with atomic number 13.
- ii. What type of bonding will be present in the oxide of the element with atomic number 17?
- iii. Which feature of the atomic structure accounts for the similarities in the chemical properties of the elements in Group 17 of the periodic table?
- iv. Name the element which has the highest ionisation potential.
- v. How many electrons are present in the valence shell of the element with atomic number 18?

Question 7

[3]

a.

- i. Name the process used for the large-scale manufacture of sulphuric acid.
- ii. Which property of sulphuric acid accounts for its use as a dehydrating agent?
- iii. Concentrated sulphuric acid is both an oxidising agent and a non-volatile acid. Write one equation each to illustrate the above-mentioned properties of sulphuric acid.

b. Give reason for the following:

[2]

Carbon dioxide and sulphur dioxide cannot be distinguished by using lime water.

c. Name the following:

[5]

- i. Two compounds of lead which combine with conc. HCl to liberate chlorine.
- ii. Solvent for noble metal.
- iii. The gas obtained when rock salt reacts with conc. sulphuric acid.
- iv. Drying agent for hydrogen chloride gas.
- v. Solvent for silver chloride.