

CLASS IX - ANNUAL EXAMINATION

CHEMISTRY

SCIENCE Paper – 2

(Two hours)

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) Fill in the blanks with the choices given in brackets: [5]
- (i) The molecular formula of Aluminium Oxide is _____ (AlO_3 / Al_2O_3).
 - (ii) The vertical columns in the periodic table are _____ (groups / periods).
 - (iii) Group II metals are called _____ metals. (alkali / alkaline earth)
 - (iv) According to the modern Periodic Law, physical and chemical properties of element are periodic functions of their _____ (atomic weight / atomic numbers).
 - (v) A carbonate that does not decompose on heating is _____ (K_2CO_3 / CaCO_3).

This Paper consists of 7 printed pages.

- (b) Choose the most appropriate answer for each of the following: [5]
- (i) Which of the following is a covalent compound?
- A. Sodium chloride
 - B. Carbon tetrachloride
 - C. Magnesium chloride
 - D. Calcium chloride
- (ii) The salt that undergoes photo chemical decomposition is:
- A. Copper sulphate
 - B. Zinc carbonate
 - C. Lead bromide
 - D. Silver nitrate
- (iii) With the rise in temperature the solubility of sodium chloride in water:
- A. Decreases
 - B. Increases and then decreases
 - C. Increases sharply
 - D. Increases only a little
- (iv) Which metal gives hydrogen on reacting with water, acid and alkali?
- A. Iron
 - B. Zinc
 - C. Magnesium
 - D. Lead
- (v) A substance that does not contain water of crystallization is:
- A. Blue vitriol
 - B. Common salt
 - C. Glauber's salt
 - D. Washing soda crystals

- (c) Select from the list the gas that matches the description given in each case: [5]
[Methane, Hydrogen, Nitrogen, Ammonia, Nitrogen dioxide, Chlorine]
- (i) A gas which burns in air or oxygen forming water.
 - (ii) A hydrocarbon which contributes towards the greenhouse effect.
 - (iii) A greenish yellow gas that turns moist starch iodide paper blue black.
 - (iv) A reddish-brown gas liberated on heating lead nitrate crystals.
 - (v) A basic gas which turns red litmus solution blue.
- (d) Match the atomic number 4, 6, 11, 15 and 18 with each of the following: [5]
- (i) A solid non-metal of valency 3.
 - (ii) A gas belonging to zero group.
 - (iii) An element with 2 electrons in the valence shell.
 - (iv) A non-metal of valency 4.
 - (v) A metal with one electron in the third shell.
- (e) Write a balanced chemical equation for each of the following: [5]
- (i) Action of heat on calcium bicarbonate
 - (ii) Action of dilute sulphuric acid on sodium carbonate
 - (iii) Action of hot water on heated magnesium
 - (iv) Action of dilute hydrochloric acid on Iron.
 - (v) Action of sodium hydroxide solution on aluminium.
- (f) State one relevant observation for each of the following reactions: [5]
- (i) Flame test is performed with calcium nitrate.
 - (ii) Water is added to anhydrous copper sulphate.
 - (iii) Copper carbonate is decomposed on heating.
 - (iv) Dil. H_2SO_4 is added to zinc sulphide.
 - (v) Addition of silver nitrate solution to sodium chloride solution.

- (g) Match Column A with Column B. [5]

Column A

Column B

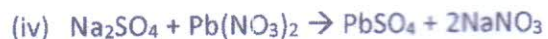
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|---------------------------------|-------------|
| (i) Liquid metal | A. Bromine |
| (ii) An element without neutron | B. Mercury |
| (iii) An oxidizing agent | C. Helium |
| (iv) A liquid non-metal | D. Hydrogen |
| (v) An inert gas | E. Oxygen |
- (h) (i) Calculate the molecular mass of ammonium carbonate $[(\text{NH}_4)_2\text{CO}_3]$. [5]
 (ii) Find the percentage of nitrogen in urea $[\text{NH}_2\text{CONH}_2]$.
 $[\text{H} = 1, \text{C} = 12, \text{N} = 14, \text{O} = 16]$

SECTION II (40 Marks)

Attempt any **four** questions from this Section

Question 2

- (a) (i) What causes permanent hardness in water? [3]
 (ii) State one advantage of using hard water.
 (iii) Give an equation for the removal of permanent hardness in water.
- (b) An atom of an element is represented as ${}_{12}^{24}\text{A}$. [3]
 (i) Write the number of protons present in one atom of the element.
 (ii) Write its electronic configuration.
 (iii) State whether it is a metal or a non-metal.
- (c) Classify the following reactions as Direct combination, Decomposition, [4]
 Displacement, Precipitation and Neutralization.
 (i) $\text{Fe} + \text{CuSO}_4 \rightarrow \text{FeSO}_4 + \text{Cu}$
 (ii) $2\text{Pb}(\text{NO}_3)_2 \rightarrow 2\text{PbO} + 4\text{NO}_2\uparrow + \text{O}_2\uparrow$

**Question 3**

- (a) Draw the orbit structure to show the formation of the following: [3]
- Oxygen molecule
 - Ammonia
 - Calcium oxide
- [H = 1, N = 7, O = 8, Ca = 20]
- (b) (i) Write the equation for the laboratory preparation of hydrogen. [3]
- (ii) How is the gas collected?
- (iii) Write the confirmatory test for Hydrogen.
- (c) Distinguish between the following: [4]
- Zinc nitrate and Copper nitrate (by heating)
 - CO₂ and SO₂ (by using a suitable reagent)

Question 4

- (a) Give reasons for each of the following: [3]
- Noble gases do not form compounds readily.
 - Table salt becomes wet and sticky during the rainy season.
 - Isotopes have the similar chemical properties.
- (b) Fill in the blanks: [3]
- By increasing the pressure on the volume of an enclosed gas at constant
- (i) _____, the volume of the gas (ii) _____. This is given by
- (iii) _____ law.

- (c) A fixed volume of a gas occupies 228 cm^3 at 27°C and 70 cm of mercury what is its volume at STP? [4]

Question 5

- (a) Differentiate between the following: [3]
- (i) Hard water and Soft water
 - (ii) Efflorescence and Deliquescence
 - (iii) Exothermic reaction and Endothermic reaction
- (b) (i) Give an equation for the formation of ozone in the atmosphere. [3]
- (ii) What is the function of ozone layer in the atmosphere?
- (iii) Name a chemical which causes ozone depletion.
- (c) Complete the following table which relates to action of heat on substances: [4]

S.No.	Substance heated	Gas evolved	Residue colour
1	Zinc Carbonate	(i)	(ii)
2	Ammonium dichromate	(iii)	(iv)

Question 6

- (a) The formula of the chloride of a metal **M** is MCl . Write the formula of its: [3]
- (i) Sulphate
 - (ii) Zincate
 - (iii) Hydroxide
- (b) Balance the following equations: [3]
- (i) $\text{P} + \text{O}_2 \rightarrow \text{P}_2\text{O}_5$
 - (ii) $\text{C}_2\text{H}_4 + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$
 - (iii) $\text{P}_2\text{O}_5 + \text{H}_2\text{O} \rightarrow \text{H}_3\text{PO}_4$

- (c) Identify the gases in each case: [4]
- (i) A gas that turns lead acetate paper black.
 - (ii) A gas that causes acid rain.
 - (iii) A colourless odourless gas that relights a glowing splint.
 - (iv) A gas that turns orange potassium dichromate paper green.

Question 7

- (a) Give the formulae of: [3]
- (i) Sodium bisulphate
 - (ii) Ammonium nitrate
 - (iii) Magnesium nitride
- (b) Define the following: [3]
- (i) Isotopes
 - (ii) Electrovalent bond
 - (iii) Atomic number
- (c) Hydrated calcium sulphate has the formula of $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$. [4]
- (i) What is the name given to the water molecules present in the salt?
 - (ii) Calculate the percentage of water molecules in hydrated calcium sulphate. [Ca = 40; S = 32; O = 16; H = 1]