

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).
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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

- | | |
|---------------------------------|-------------|
| (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 |

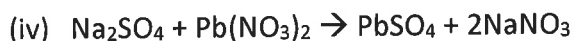
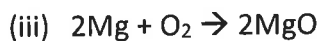
- (h) (i) Calculate the molecular mass of ammonium carbonate $[(\text{NH}_4)_2\text{CO}_3]$. [5]
 (ii) Find the percentage of nitrogen in urea $[\text{NH}_2\text{CONH}_2]$.
 [H = 1, C = 12, N = 14, O = 16]

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, Displacement, Precipitation and Neutralization. [4]
 (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]
- (i) Oxygen molecule
 - (ii) Ammonia
 - (iii) 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]
- (i) Zinc nitrate and Copper nitrate (by heating)
 - (ii) CO₂ and SO₂ (by using a suitable reagent)

Question 4

- (a) Give reasons for each of the following: [3]
- (i) Noble gases do not form compounds readily.
 - (ii) Table salt becomes wet and sticky during the rainy season.
 - (iii) 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]