

## ANNUAL EXAMINATION-2024-2025

CHEMISTRY  
(SCIENCE PAPER 2)

CLASS - IX

Maximum Marks: 80

Time allowed: 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 A is compulsory. Attempt any four questions from Section B.

The intended marks for questions or parts of questions are given in brackets [ ].

## SECTION A (40 Marks)

(Attempt all questions from this section)

## Question 1

(a) Choose the correct answers to the questions from the given options.

[15]

(Do not copy the questions, write the correct answers only.)

- (i) Which one of the following is not a greenhouse gas?  
 (a) Oxygen (b) Carbon dioxide (c) Methane (d) Water vapour
- (ii) How many carbon atoms are present in acetate radical?  
 (a) One (b) Two (c) Three (d) Four
- (iii) Identify the monovalent cation:  
 (a) Sodium (b) Aluminium (c) Chlorine (d) None of these
- (iv) The colour of gas evolved when lead nitrate decomposes is:  
 (a) Blue (b) Red (c) Brown (d) Yellow
- (v) **Assertion(A):** Hydrogen and alkali metals react with a black copper oxide to give red/brown copper.  
**Reason(R):** Hydrogen and alkali metals are good oxidizing agents.  
 (a) Both A and R are true and R is the correct explanation of A  
 (b) Both A and R are true but R is not the correct explanation for A  
 (c) A is true but R is false  
 (d) A is false but R is true
- (vi) An Example of a solution made up of solid with solid is:  
 (a) Sugar solution (b) Alloys (c) Soda solution (d) Water in alcohol
- (vii) A substance that does not contain water of crystallization is:  
 (a) Blue vitriol (b) Glauber's salt (c) Washing soda crystals (d) Common salt
- (viii) Which of the following is used in drying of gases?  
 (a) Conc.  $\text{HNO}_3$  (b) Conc.  $\text{H}_2\text{SO}_4$  (c) Conc.  $\text{HCl}$  (d) None of these
- (ix) The number of elements known in Mendeleev's presented periodic table:  
 (a) 50 (b) 90 (c) 63 (d) 102
- (x) **Assertion(A):** There is a gradual increase in the average temperature of the earth's surface.  
**Reason(R):** Greenhouse effect is responsible for increase in earth's temperature.  
 (a) Both A and R are true and R is the correct explanation of A  
 (b) Both A and R are true but R is not the correct explanation for A  
 (c) A is true but R is false  
 (d) A is false but R is true
- (xi) What is the physical state of bromine at room temperature?  
 (a) Liquid (b) Solid (c) Gas (d) None of these
- (xii) Which of the following metals doesn't react with water?  
 (a) Ca (b) Na (c) K (d) Cu
- (xiii) Excessive release of  $\text{CO}_2$  in the atmosphere is the cause of.  
 (a) Depletion of ozone (b) Formation of polar Vortex (c) Global Warming (d) Formation of smog
- (xiv) Identify the incorrect statement about isotopes:  
 (a) They have different mass numbers (b) They are atoms of the same element  
 (c) They have same physical properties (d) They have same chemical properties
- (xv) How many electrons can the outermost shell of an atom accommodate?  
 (a) 8 (b) 2 (c) 10 (d) 18

Question 2

(i)

Western Music	Do	Re	Me	Fa	So	La	Si
Indian Music	Sa	Re	Ga	Ma	Pa	Dha	Ni
	1	2	3	4	5	6	7
	H	Li	Be	B	C	N	O
	F	Na	Mg	Al	Si	P	S
	Cl	K	Ca	Cr	Ti	Mn	Fe

- (a) Name the scientist who gave this table.  
 (b) Which group of elements were not known at this time?  
 (c) This system worked quite well for the \_\_\_\_\_ (heavier/lighter) elements.  
 (d) The table shown above relates the properties of the elements to their \_\_\_\_\_ (atomic number/atomic mass)  
 (e) State one reason for rejecting this table.

(ii) Match the column A with column B.

- Column A**  
 (a) Hydrogen  
 (b) Boyle's law  
 (c) SO<sub>2</sub>  
 (d) Magnesium  
 (e) Hydrogen sulphide

- Column B**  
 1. Alkaline earth metal  
 2. Group 1  
 3. P-V relationship  
 4. Lead nitrate solution  
 5. Produced by burning coal

(iii) Complete the following by choosing the correct answers from the bracket:

- (a) \_\_\_\_\_ [Metallic/Non-metallic] elements are present on the right side of the periodic table.  
 (b) Covalency of nitrogen is \_\_\_\_\_. [two/three]  
 (c) Purified and dried hydrogen is collected over \_\_\_\_\_. [mercury /sodium]  
 (d) Ozone layer depletes due to extensive use of \_\_\_\_\_. [CFC/ozone]  
 (e) \_\_\_\_\_ [Soft water/Hard water] checks the lead poisoning.

(iv) Name the following:

- (a) A greenish yellow gas that turns moist starch iodide paper blue black.  
 (b) The inert gas of period 3.  
 (c) A reaction which takes place with the help of sunlight.  
 (d) A gas which burns with a 'pop' sound.  
 (e) Metal which burns with a golden yellow flame.

(v) Balance the following equations:

- (a)  $KClO_3 \rightarrow KCl + O_2$   
 (b)  $C_2H_4 + O_2 \rightarrow CO_2 + H_2O$   
 (c)  $S + HNO_3 \rightarrow H_2SO_4 + NO_2 + H_2O$   
 (d)  $K_2Cr_2O_7 + HCl \rightarrow KCl + CrCl_3 + H_2O + Cl_2$   
 (e)  $Al_4C_3 + H_2O \rightarrow Al(OH)_3 + CH_4$

**SECTION B (40 Marks)**

(Attempt any four questions from this section.)

**Question 3**

(i) The formula of the chloride of a metal M is MCl. Write the formula of its:

- (a) Sulphate  
 (b) Zincate  
 (c) Hydroxide

(ii) What is the valency of underlined elements in the following compounds?

- (a) NO  
 (b) MnO<sub>2</sub>

(iii) Calculate the molecular mass of magnesium nitrate crystals [Mg(NO<sub>3</sub>)<sub>2</sub>.10H<sub>2</sub>O].  
 [Mg = 24, N = 14, O = 16, H = 1]

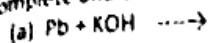
(iv) Calculate the percentage of sodium in sodium aluminium fluoride [Na<sub>3</sub>AlF<sub>6</sub>].  
 [Na = 23, Al = 27, F = 19]

**Question 4**

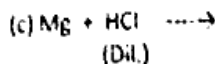
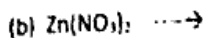
(i) Match the atomic number 2, 4, 8, 14, 15 and 19 with each of the following:

- (a) A solid non-metal of valency 3.  
 (b) An element with 4 shells.  
 (c) A gaseous element with valency 2.  
 (d) A non-metal of valency 4.  
 (e) A rare gas.

Complete and balance the following equations:



[3]



- (iv) (a) Give an equation for the formation of ozone in the atmosphere.  
(b) What is the function of ozone in the atmosphere?

[2]

### Question 5

- (i) Answer the following in respect of element  $_{16}\text{S}^{32}$ .

[4]

- (a) To which group and period does it belong?  
(b) What is its valency?  
(c) Is it a metal or non-metal?  
(d) Give its formula with hydrogen.

- (ii) Give reasons for each of the following

[3]

- (a) A white powder is formed on the surface of washing soda crystals when left exposed to atmosphere.  
(b) Common salt becomes wet during rainy season.  
(c) Ferric chloride is stored in airtight bottles.

- (iii) Predict the type of bonding in the following molecules:

[3]

- (a) Water  
(b) Calcium oxide  
(c) Ammonia

### Question 6

- (i) Classify each of the following reactions as combination, decomposition, displacement or double displacement:

[4]

- (a)  $\text{Zn} + 2\text{HCl} \rightarrow \text{ZnCl}_2 + \text{H}_2$   
(b)  $4\text{Na} + \text{O}_2 \rightarrow 2\text{Na}_2\text{O}$   
(c)  $\text{NaCl} + \text{AgNO}_3 \rightarrow \text{AgCl} + \text{NaNO}_3$   
(d)  $4\text{HNO}_3 \rightarrow 4\text{NO}_2 + 2\text{H}_2\text{O} + \text{O}_2$

- (ii) State the observation for the following, when:

[4]

- (a) Cobalt chloride paper is introduced in water vapour.  
(b) Iron nails are added to copper sulphate solution.  
(c) Carbon dioxide is passed through lime water first a little, then in excess.  
(d) Sulphur dioxide is passed through acidified  $\text{K}_2\text{Cr}_2\text{O}_7$  solution.

- (iii) State how hydrogen gas is freed from the following impurities:

[2]

- (a)  $\text{NO}_2$   
(b)  $\text{PH}_3$

### Question 7

- (i) Give the formulae of:

[4]

- (a) Magnesium phosphate  
(b) Chromium sulphate  
(c) Sodium thiosulphate  
(d) Aluminium sulphide

- (ii) (a) What is the name given to group 17 elements? Why are they called so?

[3]

- (b) Elements A, B and C are the members of triad. Element 'A' has atomic weight 40 and element 'C' has atomic weight 137.6. What is the atomic weight of 'B'?

[3]

- (iii) Define the following:

- (a) Hygroscopy  
(b) Water of crystallisation  
(c) Absolute zero

### Question 8

- (i) State the modern Periodic law.

[1]

- (ii) Name:

[2]

- (a) A salt of calcium that causes temporary hardness of water.  
(b) A salt of magnesium that causes permanent hardness of water.

- (iii) A gas occupies  $150 \text{ cm}^3$  at  $57^\circ\text{C}$ . Find the temperature to which the gas be heated, so that its volume triples, without any change in pressure.

[3]

- (iv) A fixed volume of a gas occupies  $228 \text{ cm}^3$  at  $27^\circ\text{C}$  and  $70 \text{ cm}$  of mercury what is its volume at STP?

[4]