

# FINAL EXAMINATION: 2024 -2025

CLASS: IX

SUBJECT: CHEMISTRY

NAME OF STUDENT: .....

MAX. MARKS: 80

DATE: .....

TIME: 2 HOURS

**NOTE:** 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

Choose the correct answers to the questions from the given options:

[15]

(Do not copy the question, write the correct answers only)

(i) The similarity between chlorine gas and sulphur dioxide gas is:

- |  |                                     |
|--|-------------------------------------|
| (a) Both turns lime water milky          | (c) Both are oxidizing agents       |
| (b) Both bleaches the moist litmus paper | (d) Both have same smell and colour |

(ii) Assertion(A): Hydrogen can be placed in group VIIA (17).

Reason (R): Hydrogen can gain an electron to achieve a noble gas configuration.

- |   |                           |
|---|---------------------------|
| (a) Both A and R are individually true and R is correct explanation of A.         | (c) A is true R is false. |
| (b) Both A and R are individually true but R is not the correct explanation of A. | (d) A is false R is true. |

(iii)  $CaCO_3(s) \xrightarrow{\Delta} CaO(s) + CO_2(g)$  is an example of:

- |                            |                                   |
|----------------------------|-----------------------------------|
| (a) Displacement reaction  | (c) Double decomposition reaction |
| (b) Decomposition reaction | (d) Combination reaction          |

(iv)  $A \longrightarrow A^{+3}; \quad B \longrightarrow B^{-2}$ :

Number of electrons present in the outermost shell of atoms A and B respectively are:

- |         |         |
|---------|---------|
| (a) 3,7 | (c) 5,2 |
| (b) 3,6 | (d) 5,6 |

(v) A salt which leaves black residue on heating is:

- |                      |                         |
|----------------------|-------------------------|
| (a) Lead carbonate   | (c) Calcium carbonate   |
| (b) Copper carbonate | (d) Magnesium carbonate |

(vi) The formula of Magnesium hydrogen carbonate is:

- |                   |                   |
|-------------------|-------------------|
| (a) $MgHCO_3$     | (c) $Mg_2HCO_3$   |
| (b) $Mg(HCO_3)_2$ | (d) $Mg(HCO_3)_3$ |

(vii) Which of the following statement is incorrect about the elements – Na, Mg, Al, Si:

- |   |  |
|---|--|
| (a) Each element belongs to the same period | (c) They are written in the order of their increasing non-metallic character |
| (b) Each element have the same valency      | (d) Number of shells are same  |

(viii) According to the modern periodic law, the properties of elements are a periodic function of their:

- (a) Mass number (c) Atomic number  
(b) Atomic volume (d) Atomic weight

(ix) How many electrons are most likely transferred to, or from Ca, when it forms an ion:

- (a) 1 electron gained (c) 2 electrons gained  
(b) 2 electrons lost (d) Electrons neither gained nor lost

(x) The electronic configuration of  $O^{2-}$  is:

- (a) 2,8 (c) 2,8,6  
(b) 2,6 (d) 2,8,8

(xi) Which of the following is an example of a decomposition reaction?

- (a)  $2KClO_3 \rightarrow 2KCl + 3O_2$  (c)  $Zn + 2HCl \rightarrow ZnCl_2 + H_2$   
(b)  $2H_2 + O_2 \rightarrow 2H_2O$  (d)  $N_2 + O_2 \rightarrow 2NO$

(xii) 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 individually true and R is correct explanation of A. (c) A is true R is false.  
(b) Both A and R are individually true but R is not the correct explanation of A. (d) A is false R is true.

(xiii) If the pressure is doubled for a fixed mass of a gas, its volume will become:

- (a) 4 times (c) 2 times  
(b) 1/2 times (d) No change

(xiv) An element 'E' has 18 protons and 22 neutrons in its atom. An atom of this element is correctly represented by the symbol:

- (a)  ${}^{40}_{18}E$  (c)  ${}^{18}_{22}E$   
(b)  ${}^{42}_{18}E$  (d)  ${}^{22}_{18}E$

(xv) The absolute temperature value that corresponds to  $36^\circ C$  is:

- (a) 400K (c) 309K  
(b) 237K (d) 298K

### Question 2

(i) Match Column A with Column B:

[5]

Column A	Column B
(a) Torr	1. Noble gases
(b) Highly reactive metals	2. Amphoteric metal
(c) Zinc	3. Alkali metals
(d) Kelvin	4. Pressure
(e) Non- reactive elements	5. Temperature

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

[5]

- (a) The element below sodium in the periodic table is \_\_\_\_\_  
reactive than sodium. (less/more)

- (b) \_\_\_\_\_ is a gas having a triple bond. (Nitrogen/Ammonia)
- (c) The average kinetic energy of the molecules of a gas is proportional to the \_\_\_\_\_ . (absolute temperature/pressure)
- (d) Going across a period from left to right, atomic size \_\_\_\_\_. (increases/decreases)
- (e) Ozone depletion is mainly caused by the active \_\_\_\_\_ atoms generated from CFC in the presence of UV radiation. (chlorine/fluorine)

(iii) Name the following:

[5]

- (a) Name an element that does not form compound.
- (b) A metal hydroxide which on heating forms metal oxide and water vapours.
- (c) A metal that yields hydrogen when reacts with an acid as well as an alkali.
- (d) A metal that reacts reversibly with steam.
- (e) An oxidizing agent that does not contain oxygen.

(iv) What do you observe when:

[5]

- (a) Silver nitrate solution is added to sodium chloride solution.
- (b) Lead nitrate crystals are heated strongly.
- (c) Ferrous sulphate crystals undergoes thermal decomposition.
- (d) A piece of sodium is added to a trough containing cold water to which a few drops of red litmus solution has been added.
- (e) Cobalt chloride paper is introduced in water vapour.

(v) The atom of an element X has 17 electrons, 17 protons and 18 neutrons.

[5]

- (a) Represent the element in the form  ${}_Z X^A$ .
- (b) What is the atomic number and mass number of the element?
- (c) What type of ion will be formed by an atom of element X?
- (d) Write down the electronic configuration of the element.
- (e) Will element X be a reducing agent or an oxidizing agent?

#### SECTION B (40 Marks)

(Attempt any four questions from this Section)

Question 3

(a) Write your observation when dilute sulphuric acid is added to the following:

[2]

- (i) A metal carbonate
- (ii) A metal sulphide

(b) State whether the substance printed in bold letters have been oxidized or reduced:

[2]

- (i)  $\mathbf{Mg} + 2\text{HCl} \rightarrow \text{MgCl}_2 + \text{H}_2$
- (ii)  $\mathbf{PbO} + \text{CO} \rightarrow \text{Pb} + \text{CO}_2$

(c) Calculate the percentage of Sodium in:

[2]

- (i) Sodium carbonate  $\text{Na}_2\text{CO}_3$

(ii) Sodium phosphate  $\text{Na}_3\text{PO}_4$

(Atomic mass of Na = 23, O = 16, P = 31, C = 12)

(d) Answer the following which are based on the elements of atomic number 1 to 20 in the periodic table: [3]

(i) Write the formula of the sulphate of the element with atomic number 12.

(ii) State the number of shells present in the atoms of elements in the second period.

(iii) Name the group where the element with atomic number 16 is placed.

(e) Which property of water enables it to modify the climate? [1]

#### Question 4

(a) The formula of the carbonate of the metal 'M' is  $\text{M}_2\text{CO}_3$ . State the formula of its: [2]

(i) Sulphate (ii) Hydroxide

(b) Give a balanced chemical equation for the following: [2]

(i) Laboratory preparation of hydrogen.

(ii) Preparation of hydrogen from an alkali.

(c) Complete the following reactions: [2]

(i)  $\text{NaCl}(\text{aq}) + \text{AgNO}_3(\text{aq}) \rightarrow$

(ii)  $\text{CuCO}_3 \xrightarrow{\Delta}$

(d) State the following: [4]

(i) Volume of a gas at 0 Kelvin.

(ii) Absolute temperature of a gas at  $7^\circ\text{C}$ .

(iii) Ice point in absolute temperature.

(iv) S.T.P. conditions.

#### Question 5

(a) Explain why: [2]

(i) Mountaineers carry oxygen cylinder with them.

(ii) Lakes and rivers do not suddenly freeze in winters.

(b)  $800 \text{ cm}^3$  of a gas is collected at 654 mm Hg pressure. At what pressure would the volume of the gas reduce by 40% of its original volume, temperature remaining constant? [2]

(c) State the original color of the following substance and colour of residue obtained after heating: [2]

(i) Ammonium dichromate

(ii) Zinc carbonate

(d) Write a chemical equation for the reaction involving: [3]

(i) Two gases combining to form a white solid.

(ii) A blue solution.

(iii) Two solids combining to form a liquid.

(e) Solubility of a substance at  $45^\circ\text{C}$  is 36.5g. What is meant by this statement? [1]

#### Question 6

(a) State Boyle's Law and give it's [2]

(i) mathematical expression &

(ii) one significance

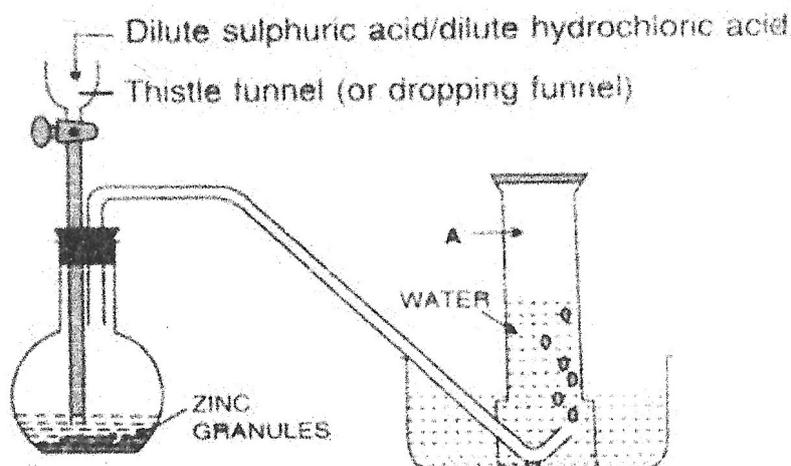
(b) Give one importance each of dissolved salt and dissolved gases in water. [2]

(c) Name any two: [2]

(i) Gases which are responsible for the formation of acid rain.

(ii) Natural sources of atmospheric pollution.

(d) Rahul prepared a gas in the laboratory using the set-up shown below: [3]



(i) Which gas is prepared by this method marked as A.

(ii) Name the method of collection of the gas.

(iii) Why nitric acid is not used as a reactant in the above method?

(iv) Why Conc. sulphuric acid is not used as a drying agent in the above method?

(e) What is water gas and how is it produced? [1]

#### Question 7

(a) Name the gas that: [3]

(i) Turns moist starch iodide paper blue black.

(ii) Turns moist red litmus blue.

(iii) Does not affect acidified  $K_2Cr_2O_7$  paper but turns lime water milky.

(b) The following table shows the electronic configuration of atoms A, B, C and D. [3]

Element	A	B	C	D
Electronic configuration	2,8,8,2	2,6	2,8,7	2,4

Write the formula of the compound formed between

(i) A and B

(ii) D and C

(iii) Which one of them will form a cation?

(c) In the reaction:  $H_2S + Cl_2 \longrightarrow 2HCl + S$ , identify the following: [3]

(i) Reducing agent

(ii) Substance oxidized

(iii) Oxidizing agent

(d) From the following nuclei, choose the isotopes: [1]

(i)  $8p+8n$

~~(i)~~ <sup>(iii)</sup>  $8p+9n$

(ii)  $18p+22n$

(iv)  $20p+20n$

Question 8

(a) What are the following groups known as: [3]

(i) Group 1

(ii) Group 17

(iii) Group 18

(b) Potassium (atomic no. 19) and chlorine (atomic no. 17) forms a compound. Explain the formation of the compound on the basis of: [4]

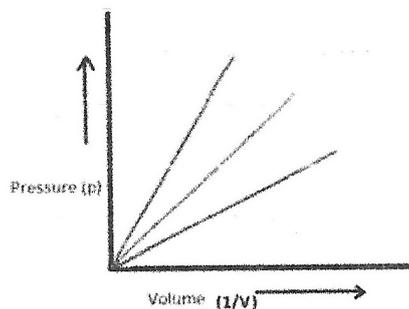
(i) Oxidation

(ii) Reduction

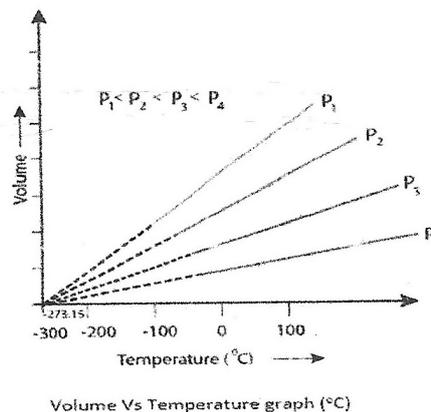
(iii) Oxidizing agent

(iv) Reducing agent

(c) State the laws which are represented by the following graphs A and B: [2]



A



B

(d) Why lead being above hydrogen in the reactivity series is not preferred for the preparation of hydrogen from acids? [1]