

**St. Mary's Convent Inter College, Prayagraj****First Terminal Examination 2025-26****Subject – Chemistry****Time : 2hrs.****Class - 9****M.M. : 80****Name :****Roll No.****Date :****SECTION A***(Attempt all questions from this Section)***Question 1****[15]**

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

- i. When chlorine is passed through the solution of KI, the colourless solution changes to:
(a) black (b) pale yellow
(c) green (d) yellow brown
- ii. The least reactive metal in the reactivity series is:
(a) sodium (b) gold
(c) platinum (d) Iodine
- iii. A reaction of a type: $AB + CD \rightarrow AD + CB$, involves:
(a) no chemical change (b) exchange of ions of AB and CD
(c) decomposition of AB and CD (d) combination of AB and CD
- iv. The substance having no water of crystallization is:
(a) blue vitriol (b) white vitriol
(c) common salt (d) epsom salt
- v. The gas evolved in the thermal decomposition of solid potassium nitrate will:
(a) extinguish a glowing wooden splinter
(b) turn pyragallol solution dark brown
(c) turn moist red litmus blue
(d) turn moist blue litmus red
- vi. The electronic configuration of magnesium is:
(a) 2,8,1 (b) 2,8,3
(c) 2,8,2 (d) 2,8
- vii. Substances which remove even the chemically combined water molecules from the compound:
(a) Dehydrating agents (b) Anhydrous substances
(c) Drying agents (d) Reducing agents
- viii. Chloride ion is a negatively charged ion with:
(a) 9 protons and 10 electrons (b) 17 protons and 18 electrons
(c) 9 protons and 8 electrons (d) 17 protons and 16 electrons
- ix. Assertion (A): Concentrated sulphuric acid absorbs moisture from the air and gets diluted over time when left open.
Reason (R): Sulphuric acid is a deliquescent substance that dissolves in the moisture it absorbs.
(a) Both A and R are true, and R is the correct explanation of A
(b) Both A and R are true, and R is not the correct explanation of A
(c) A is true, but R is false
(d) A is false, but R is true
- x. Select the compound that is classified as a covalent compound:
(a) sodium chloride (b) magnesium chloride
(c) carbon tetrachloride (d) calcium chloride



- xi. Which of the following will gain two electrons to form an anion?
(a) chlorine (b) magnesium
(c) calcium (d) oxygen
- xii. The solubility of this substance increases drastically with rise in temperature:
(a) Calcium sulphate (b) Sodium chloride
(c) Potassium nitrate (d) Potassium sulphate
- xiii. The number of protons, neutrons and electrons present in deuterium are:
(a) 1,0,1 (b) 0,1,1
(c) 1,1,0 (d) 1,1,1
- xiv. What is the chemical formula of iron (III) sulphate?
(a) FeSO_4 (b) $\text{Fe}_2(\text{SO}_4)_3$
(c) $\text{Fe}_3(\text{SO}_4)_2$ (d) FeS
- xv. The white colored precipitate that dissolves in excess of ammonium hydroxide solution:
(a) Silver chloride (b) Cupric hydroxide
(c) Barium sulphate (d) Lead sulphate

Question 2

- i. A family uses groundwater containing calcium chloride. To soften the water, they add washing soda (Na_2CO_3), which leads to the formation of a white precipitate and improves soap lathering. Answer the following questions with respect to the chemical reaction. [5]
- (a) What type of hardness can be removed by using washing soda?
- (b) Write a balanced chemical equation for the reaction between calcium chloride and washing soda.
- (c) Calculate the **relative molecular mass** of washing soda (Na_2CO_3).
[Na = 23, C = 12, O = 16]
- (d) Predict what would happen if magnesium sulphate is present in water and washing soda is added.
- (e) State the type of chemical reaction it represents.
- ii. Match the following column A with column B. [5]

Column A	Column B
(a) Electrovalent bond	1. Number of protons
(b) Turns moist blue litmus red	2. Protons + neutrons
(c) Atomic number	3. Carbon dioxide
(d) Mass number	4. Hydrogen
(e) Pale blue flame	5. Sodium chloride



iii. Complete the following by choosing the correct answers from the brackets: [5]

- (a) The chemical formula of green vitriol is _____. [FeSO₄.7H₂O / MgSO₄.7H₂O]
- (b) The mass of one molecule of hydrogen is _____. [1 amu / 2 amu]
- (c) The insoluble product formed after the mixing of two solutions is known as _____. [filtrate / precipitate].
- (d) For an atom to be chemically reactive, its octet should be _____. [complete/ incomplete]
- (e) The formula for bicarbonate is _____. [CO₃²⁻ / HCO₃⁻]

iv. Identify the following: [5]

- (a) A greenish yellow gas with a sharp pungent odour.
- (b) A metal which burns with a dazzling white light.
- (c) A reddish brown gas produced during the thermal decomposition of zinc nitrate.
- (d) The most reactive non-metal in the reactivity series.
- (e) A gas which rekindles a glowing splinter and is neutral to moist blue litmus paper.

v. Draw the atomic orbital structure for the formation of:

- (a) Calcium oxide. [3]
- (b) Ammonia molecule. [2]

SECTION B

(Attempt any four questions.)

Question 3

- i. The valency of metal 'A' is 2. Give the formula of its: [2]
 - (a) nitride
 - (b) sulphate
- ii. Calculate the percentage composition of oxygen in Ca₃(PO₄)₂. [2]
[Ca=40, P=31, O=16]
- iii. Give a balanced chemical equation for the following reactions: [3]
 - (a) decomposition of calcium nitrate.
 - (b) barium chloride is added to sulphuric acid.
 - (c) sodium hydroxide and hydrochloric acid are made to react.
- iv. Give reason why: [3]
 - (a) chlorine displaces bromine from KBr.
 - (b) the valency of oxygen is 2.
 - (c) water is called a universal solvent.

Question 4

- i. State one relevant observation in the following cases: [2]
 - (a) Thermal decomposition of FeSO₄.
 - (b) Few pieces of zinc is added to aqueous solution of copper sulphate.
- ii. Write any two advantages of hard water. [2]
- iii. Match the atomic numbers 4,8,10,15 and 19 with each of the following: [3]
 - (a) Element which can form trivalent ion.
 - (b) Element with six valence electrons.
 - (c) Element which does not form an ion.



- iv. Riya was performing an experiment in the school laboratory to study the solubility of salt in water. She took 100 mL of water in a beaker and started adding common salt to it while stirring. After a point, no more salt would dissolve in it. [3]

Answer the following questions with respect to the information given above:

- (a) Why did the salt stop dissolving after a certain point in Riya's experiment?
(b) What change Riya will observe if she would heat the salt solution?
(c) Apart from heating, what else can Riya do to continue with her study of solubility of salts in water ?

Question 5

- i. Answer the following: [3]
(a) Calculate the relative molecular mass of KCl [K=39, Cl=35.5]
(b) Write the basic radical in sodium zincate.
(c) What do you understand by neutralization reaction?
- ii. Write the common names for the following compounds: [3]
(a) Sodium sulphate decahydrate
(b) Calcium oxide
(c) Calcium hydroxide
- iii. An atom of an element is represented as ${}^{27}_{13}\text{X}$. Find: [4]
(a) Number of neutrons present in the nucleus of 'X'.
(b) Valency of the element 'X'.
(c) Number of shells present in the atom 'X'.
(d) Write the chemical name of the compound formed when 'X' and oxygen react with each other.

Question 6

- i.) Define the term:- [2]
(a) Electrovalent bond. (b) Isotopes.
- ii.) Give the difference between soft water and hard water in terms of soap. [2]
- iii.) Balance the following equation:- [3]
(a) $\text{Al}_2\text{O}_3 + \text{H}_2\text{SO}_4 \longrightarrow \text{Al}_2(\text{SO}_4)_3 + \text{H}_2\text{O}$
(b) $\text{C}_5\text{H}_{12} + \text{O}_2 \longrightarrow \text{CO}_2 + \text{H}_2\text{O}$
(c) $\text{Mg} + \text{HCl} \longrightarrow \text{MgCl}_2 + \text{H}_2$
- iv.) What is the valency of [3]
(a) Fluorine in CaF_2 (b) Sulphur in SF_6 (c) Carbon in CH_4

Question 7

- (i) Draw the orbital structure of ${}_{12}\text{Mg}^{24}$ and ${}_{18}\text{Ar}^{40}$ [2]
- (ii) Write the electronic configuration of the following:- [2]
(a) ${}_{17}\text{Cl}^{35}$. (b) ${}_{11}\text{Na}^{23}$
- (iii) Give reasons:- [3]
a) A solution is always clear and transparent.
b) Table salt becomes sticky on exposure to humid air during rains.
c) Hard water is unfit for drinking.
- (iv) Give three characteristics of true solution. [3]