HALF YEARLY EXAMINATION: 2025-2026
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) In the compound Aluminium nitride (AℓN):
P— Aℓ is monovalent, N is monovalent
Q— Aℓ is divalent, N is divalent
R— Aℓ is trivalent, N is trivalent
(a) Only P (b) Only Q
(c) Only R (d) Both P and R

(ii) Chemical formula of iron(III) sulphate is:
(a) Fe_3SO_4 (b) $Fe_2(SO_4)_3$
(c) $FeSO_4$ (d) $Fe_3(SO_4)_2$

(iii) In $CaCO_3$, the valency of calcium ion and carbonate ion respectively is:
(a) 1 and 2 (b) 2 and 2
(c) 1 and 3 (d) 3 and 1

(iv) Assertion (A): All chemical equations should be balanced.
Reason (R): Balanced equation comply with the "Law of conservation of matter".
(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 of A.
(c) A is true but R is false.
(d) A is false but R is true.

(v) Atomic nucleus was discovered by:
(a) Chadwick (b) Goldstein
(c) Rutherford (d) Thomson

(vi) An element Y has 2 electrons in its third orbit and X has 7 electrons in its third orbit. The compound formed between them has the formula:
(a) Y_7X_2 (b) YX_2
(c) XY_2 (d) Y_2X_7

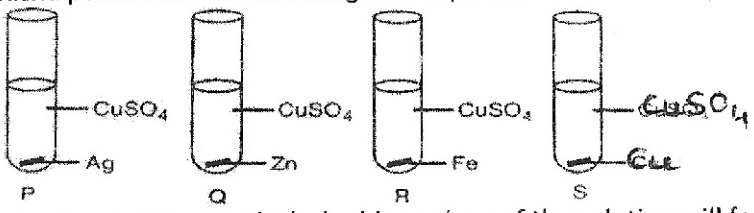
(vii) Isotopes differ in the number of their:
(a) neutrons (b) electrons
(c) protons (d) electrons and protons

(viii) The electronic configuration of Ca^{2+} is:
(a) 2, 8, 2 (b) 2, 8, 8,2
(c) 2, 8, 6 (d) 2, 8, 8

(ix) Select the incorrect option:
(a) Efflorescent substances lose their water of crystallisation on exposure to dry air.
(b) Sodium chloride is deliquescent.
(c) $MgSO_4$ causes hardness in water.
(d) Isotopes have similar chemical properties.

(x) There are 3 electrons in M shell of an atom. Its atomic number is:
(a) 5 (b) 13
(c) 15 (d) 17

(xi) Richa performed the following four experiments.



The experiments in which the blue colour of the solution will fade are:

(a) P and Q (b) Q and R
(c) P, Q and R (d) Q, R and S

(xii) In the formation of NaCℓ, the nearest noble gas configuration attained by Na and Cℓ respectively are:

(a) He and Ne (b) He and Ar
(c) Ne and Ar (d) Ar and Ne

(xiii) In $(NH_4)_xPO_4$, the value of x is:

(a) 1 (b) 2
(c) 3 (d) 4

(xiv) Assertion(A) : Chlorine can displace iodide ions from KI solution.
Reason(R): Chlorine is placed below iodine in the reactivity series.

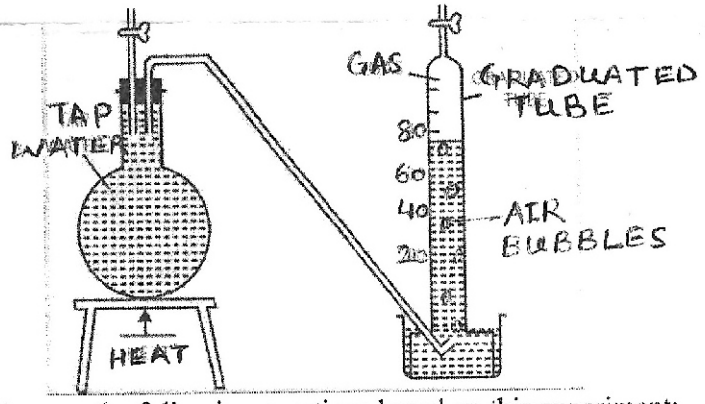
(a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true but R is not the correct explanation of A.
(c) A is true but R is false.
(d) A is false but R is true.

(xv) The characteristic of electrovalent compound is that:

(a) It is formed by sharing of electrons.
(b) It is formed by transfer of electrons.
(c) It is formed between two non-metals.
(d) It often exists as a liquid.

Question 2

(i) (a) Neha performed the following experiment in the laboratory with the given setup: [3]



Answer the following questions based on this experiment:

(1) What did she observe in the experiment?
(2) Why boiled water tastes flat?
(3) Why the composition of air dissolved in water differs from ordinary air?

(b) Calculate the relative molecular mass of $(NH_4)_2CO_3$. [2]
[At. Mass: N =14, H = 1, C = 12, O = 16]

(ii) Name the following: [5]

(a) A carbonate which does not decompose on heating.
(b) The substance that removes chemically combined elements of water in the ratio of 2:1 (hydrogen : oxygen) from a compound.
(c) A metal with valency 2
(d) An example of a solution formed by mixing a solid with another solid.
(e) Isotope of hydrogen which does not contain any neutron in its nucleus.

(iii) (a) Balance the following chemical equations: [3]

1) $Cu + H_2SO_4 \rightarrow CuSO_4 + SO_2 + H_2O$
2) $Pb_3O_4 \rightarrow PbO + O_2$
3) $MnO_2 + HCl \rightarrow MnCl_2 + H_2O + Cl_2$

(b) What do you observe in the following cases? [2]

1) Lead nitrate is heated.
2) Sodium chloride solution is added to silver nitrate solution.

(iv) (a) Give reasons: [3]
1) Argon does not react.
2) Molybdenum is used in the manufacture of ammonia.
3) Rain water does not leave behind concentric rings when boiled.

(b) Write the chemical formula of the following compounds: [2]
1) Stannic oxide.
2) Potassium permanganate.

(v) Fill in the blanks by choosing correct answers from the brackets: [5]
(a) Heating of zinc nitrate is a _____(displacement/ decomposition reaction).
(b) $CC\ell_4$ is a _____(polar/non-polar) covalent molecule.
(c) Atomic number is equal to the number of _____ (protons/neutrons) in an atom.
(d) In _____ (decomposition / double decomposition) reaction two compounds mutually exchange their positive and negative radicals.
(e) Valency of Cu in CuO is _____(1 / 2).

SECTION B (40 MARKS)
(Attempt any four questions from this Section)

Question3
(i) What do the following symbols stand for? [2]
(a) 2O (b) O_2

(ii) Define: (a) Chemical change [1+1]
(b) Effervescence

(iii) $M(NO_3)_3$ is the formula of the nitrate of a metal M. Write the formula of its: [3]
(a) hydroxide (b) chromate (c) aluminate

(iv) Why burns caused by steam are more severe than burns caused by boiling water? [1]

(v) Why does the temperature in Mumbai and Chennai not fall as low as in Delhi? [1]

(vi) State one major drawback of Rutherford's atomic model. [1]

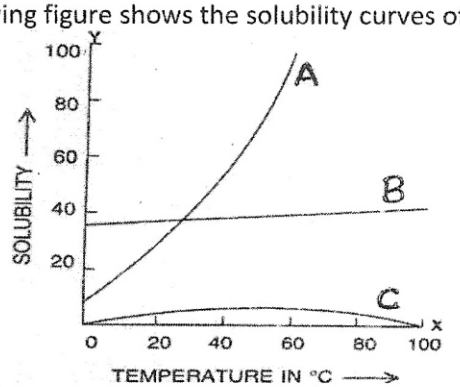
Question 4
(i) State the type of chemical bonding in the following: [3]
(a) Chlorine molecule
(b) Methane
(c) Magnesium chloride

(ii) A solution contains 30g of sodium chloride in 370g of water. Calculate the concentration of the solution. [2]

(iii) Write the chemical names of the following compounds: [4]
(a) $Na_2S_2O_3$
(b) $CaBr_2$
(c) $KA\ell O_2$
(d) MgO

(iv) Why non-metals form negative ions? [1]

Question 5
(i) The following figure shows the solubility curves of $NaC\ell$, KNO_3, and hydrated $CaSO_4$



Identify the curves A, B and C with the salt it represents. [3]

(ii) Draw the electron dot structure of: [3]
(a) CaO
(b) Water
(c) Nitrogen molecule

(iii) Give the formula and valency of: [3]
(a) thiosulphate
(b) ferrous
(c) aluminium

(iv) Find the valency of nitrogen in NO_2. [1]

Question 6

(i) Calculate the percentage mass of water in Glauber's salt ($Na_2SO_4.10H_2O$) [3]
[Given atomic mass of: Na = 23, S = 32, O = 16, H = 1]

(ii) Composition of the nuclei of two atoms A and B are given below. What is the relation between the two atoms and which element or elements they represent? [2]

	A	B
protons	18	20
neutrons	22	20

(iii) Write the basic radicals and acidic radicals of the following: [3]
(a) Calcium bicarbonate
(b) Ammonium chloride
(c) Potassium zincate

(iv) How is aquatic life benefitted by the fact that water has maximum density at 4^0C? [1]

(v) Complete and balance the reaction: $Pb(NO_3)_2 + KI \rightarrow$ [1]

Question 7

(i) Distinguish between the following on the basis of the instructions given in brackets: [3]
(a) Endothermic reaction and Exothermic reaction (energy change)
(b) Temporary hard water and Permanent hard water (cause)
(c) Cathode rays and Anode rays (constituent particles)

(ii) Write the balanced equations for the following: [2]
(a) Removal of temporary hardness in water by boiling.
(b) Photochemical decomposition of silver nitrate.

(iii) Complete the table: [5]

Element	Mass number	Atomic number	Number of protons	Number of neutrons	Electronic configuration
Potassium	39	(a)	19	(b)	(c)
Sulphur	(d)	16	16	16	(e)

Question 8

(i) Draw the orbit diagram of: [2]
(a) Magnesium ion
(b) Chlorine atom

(ii) Classify the following as Precipitation, Neutralization and Combination reactions: [3]
(a) $NaOH + HCl \rightarrow NaCl + H_2O$
(b) $2Fe + 3Cl_2 \rightarrow 2FeCl_3$
(c) $BaCl_2 + Na_2SO_4 \rightarrow BaSO_4 + 2NaCl$

(iii) Match the Column A with Column B: [5]

A	B
a) Caustic potash	(1) NH_3
b) Baking soda	(2) $CaCO_3$
c) Ammonia	(3) CH_4
d) Methane	(4) $NaHCO_3$
e) Limestone	(5) KOH

END