ICSE
Class IX Chemistry

Time: 2 Hours. **Total Marks: 80**

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 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
(*Attempt **all** questions from this Section*)

Question 1

Choose one correct answer to the questions from the given options: [15]

i. Valency of magnesium atom is:
   a. (a) 3
   b. (b) 4
   c. (c) 2
   d. (d) 5

ii. The reaction between iron filings and sulphur powder is an example of:
   a. Combination reaction
   b. Decomposition reaction
   c. Redox reaction
   d. Endothermic reaction

iii. Select a hygroscopic substance.
   a. Stone
   b. Copper
   c. Paper
   d. Glass

iv. Which of the following formulae of elements were used by Mendeleev for giving the classification?

a. Sulphides
b. Nitrides
c. Carbonates
d. Oxides

v. **Assertion (A)**: Potassium nitrate decomposes to give potassium nitrite along with evolution of nitrogen gas which is represented by the equation:

$KNO_3 \quad KNO_2 + O_2$

Reason (R): An equation must be balanced in order to comply with "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.

vi. Which of the following is a use of an electrolytic decomposition reaction?

a. To obtain metals from their ores
b. They are used in photography
c. To produce salts
d. Photosynthesis in plants

vii. The atomic number of an element is 20. In modern periodic table, this element is placed in:

a. 2_{nd} period
b. 4_{th} period
c. 1_{st} period
d. 3_{rd} period

viii. Which one of the following isotopes is used as a fuel in nuclear reactors?

a. An isotope of Uranium
b. An isotope of Iodine
c. An isotope of Cobalt
d. An isotope of Thorium

ix. Rasika added a solution of silver nitrate to a solution of sodium chloride. The product would be:

a. Black solid mass silver chlorite
b. White precipitate of silver chloride
c. Dirty green precipitate of sodium chloronitrate
d. Blue colour solution of sodium nitrite

x. The metal oxide which is reduced by hydrogen is:
   a. Al_2O_3
   b. CuO
   c. CaO
   d. Na_2O

xi. **Assertion (A)**: Solubility of Glauber's salt first increases and then decreases with temperature.
Reason (R): Glauber's salt is anhydrous above 32.8$_o$C.
   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.

xii. Newlands classification of elements did not include:
   a. Metals
   b. Noble gases
   c. Non-metals
   d. Metalloids

xiii. Which one of the following is the main reason for using helium instead of hydrogen for filling balloons?
   a. Lighter than air.
   b. Almost as light as hydrogen.
   c. Non-combustible
   d. Inflammable

xiv. Hydrogen is NOT used as a fuel in the form of:
   a. Coal gas
   b. Water gas
   c. Liquid hydrogen
   d. Ammonia gas

xv. General gas constant is represented by:
   a. (a) B
   b. (b) K
   c. (c) R
   d. (d) S

Question 2

(i) Complete the table given below by identifying V, W, X, Y and Z. [5]

Element	Symbol	No. of Protons	No. of Neutrons	No. of Electrons
Strontium	$^{88}_{38}V$	38	50	38
Chlorine	$^{35}_{17}Cl$	17	W	17
Uranium	X	92	146	92
Boron	$^{11}_{5}B$	5	6	Y
Copper	$^{63}_{29}Cu$	Z	34	29

(ii) Match the following: [5]

	Column B
(a) Element short by 1 electron in octet	(i) Transition elements
(b) Highly reactive metals	(ii) Noble gases
(c) Non-reactive elements	(iii) Alkali metals
(d) Elements of groups 3 to 12	(iv) Alkaline earth metals
(e) Radioactive elements	(v) Halogens
(f) Elements with 2 electrons in the outermost orbit	(vi)Actinides

(iii) Fill in the blanks: [5]

(a) Nitric oxide is _____toxic.
(b) The gaseous material which envelopes the Earth is called _____.
(c) The lowest region of the atmosphere is called _____.
(d) The stratosphere mainly contains _____, _____and ozone.
(e) Rain water containing H_2SO_4 and HNO_3 is called _____.

(iv) Complete the following statements: [5]

(a) The chemical change involving iron and hydrochloric acid illustrates a _____ reaction.
(b) In the type of reaction called _____, two compounds exchange their positive and negative radicals.
(c) A catalyst either _____or _____the rate of a chemical reaction but itself remains _____at the end of the reaction.
(d) On heating, hydrated copper sulphate changes its colour from _____to _____.
(e) Calcium carbonate decomposes into carbon dioxide and calcium oxide by _____ of heat.
(f) Nitrogen and hydrogen when subjected to _____pressure produce ammonia in the presence of _____iron.

(v) The description of atomic particles of two elements X and Y is given below: [5]

	X	Y
Protons	8	8
Neutrons	8	9
Electrons	8	8

(a) What is the atomic number of Y?
(b) What is the mass number of X?
(c) What is the relation between X and Y?
(d) Which element/elements do they represent?
(e) Write the electronic configuration of X?

SECTION-B

(Attempt any four questions)

Question 3

(i) Explain why the hardness of water makes it unfit for washing purposes. [3]

(ii) Convert the following on the kelvin scale: [3]

(a) 100°C
(b) 20°C
(c) -273°C
(d) 0°C

(ii) Which of the following is true/false? If the answer is false, then explain the correct answer. [4]

1. The valency of an element with atomic number 3 is 3.
2. The ionisation energy tends to increase as one move from left to right across a period.

Question 4

(i) What happens when sodium is dropped in cold water? [2]

(ii) Balance the following reactions: [2]

(a) $NH_3 + Cl_2 \rightarrow NH_4Cl + N_2$
(b) $CaOCl_2 + NH_3 \rightarrow CaCl_2 + N_2 + H_2O$

(iii) Define the following: [3]

(a) Pollutants
(b) Air pollution
(c) Photochemical smog

(iv) Give the names of the following compounds. [3]

(a) $CaSO_4$
(b) $Zn(OH)_2$
(c) $AgNO_3$

Question 5

(i) Give reasons: [2]

(a) Electrovalent compounds conduct electricity in a molten or aqueous state.

(b) Electrovalent compounds have high melting and boiling points, while covalent compounds have low melting and boiling points.

(ii) Which of the following changes are endothermic or exothermic? [2]

(a) Dissolution of quick lime in water

(b) Dissolution of ammonium chloride in water

(iii) The volume occupied by a certain gas was found to be 5.6 dm3 at 2 atmospheric pressure. If the pressure is increased by 20%, find the new volume of the gas. [3]

(iv) What happens when electric current is passed through acidified water? Give reactions. [3]

Question 6

(i) Draw an atomic orbital diagram of bonding between two oxygen atoms. [2]

(ii) How can we make equations more informative? [2]

(iii) What will be the reaction between metals like magnesium and aluminium with hot water and steam? [3]

(iv) Hydrogen gas occupies a volume of 400 cm_3 at a temperature of 27°C and normal atmospheric pressure. Find the volume of the gas at 10°C at constant pressure. [3]

Question 7

(i) List out the postulates of Thomson's model of the atom. [2]

(ii) What is meant by scavenging? [2]

(iii) Give three uses of hydrogen. [3]

(iv) 100 cm3 of a gas at 27°C is cooled to 20°C at constant pressure. Calculate the volume of gas at 20°C. [3]