ICSE Board
Class IX Chemistry
Paper - 3

Time: 2 hrs **Total Marks: 80**

General Instructions:

1. Answers to this paper must be written on the paper provided separately.
*2. You will **not** be allowed to write during the first **15** minutes.*
This time is to be spent in reading the question paper.
3. The time given at the head of the paper is the time allotted for writing the answers.
*4. Attempt **all** questions from **Section I** and **any four** questions from **Section II**.*
5. The intended marks of questions or parts of questions are given in brackets [ ].

SECTION I (40 Marks)

*Attempt **all** questions from this section.*

Question 1

(a) Define:

i. Valency
ii. Solute
iii. Cation
iv. Symbol
v. Element

[5]

(b) State the type of chemical reactions of the following:

i. $2Pb(NO_3)_2 \xrightarrow{\Delta} 2PbO + 4NO_2 + O_2$
ii. $C + O_2 \xrightarrow{\Delta} CO_2$
iii. $2CO + O_2 \xrightarrow{\Delta} 2CO_2$
iv. $CuCO_3 \xrightarrow{\Delta} CuO + CO_2$
v. $NH_4Cl \underset{\text{cool}}{\overset{\Delta}{\rightleftharpoons}} NH_3 + HCl.$

[5]

(c) What does a balanced chemical equation convey? Explain in detail. [5]

(d) Write the formula of the following salts:

i. Mercury (II) nitrate/mercuric nitrate
ii. Sodium chlorate
iii. Calcium oxalate
iv. Sodium acetate
v. Cupric hydroxide [5]

(e) Write the formula and balance the following chemical equations:

i. Sodium hydroxide + Sulphuric acid $\rightarrow$ Sodium sulphate + Water
ii. Potassium bicarbonate + Sulphuric acid $\rightarrow$ Potassium sulphate + Carbon dioxide + Water
iii. Iron + Sulphuric acid $\rightarrow$ Ferrous sulphate + Hydrogen
iv. Chlorine + Sulphur dioxide + Water $\rightarrow$ Sulphuric acid + Hydrogen chloride
v. Silver nitrate $\rightarrow$ Silver + Nitrogen dioxide + Oxygen [5]

(f) State whether the following statements are True or False.

i. During an endothermic reaction, heat is liberated.
ii. During a chemical change, a new product is always formed.
iii. 1 atmospheric pressure is equal to 760 mm of Hg..
iv. Sodium nitrate is stable towards heat.
v. Neutralisation is a type of double decomposition reaction. [5]

(g) Name the following:

An element A atomic number 7 mass numbers 14

B electronic configuration 2,8,8

C electrons 13, neutrons 14

D Protons 18 neutrons 22

E Electronic configuration 2,8,8,1

(h) Each question has four options out of which only one option is correct. Write the correct option.

i. Choose the air pollutant which is non-acidic.
   (a) NO_2
   (b) SO_2
   (c) SO_3
   (d) Ozone

ii. Choose the odd one.
   (a) HCl
   (b) H_2CO_3
   (c) HNO_3
   (d) H_2SO_4

iii. On adding water to sodium, the solution formed is
   (a) Neutral
   (b) Alkaline
   (c) Acidic
   (d) Amphoteric

iv. According to Boyle's law, as the pressure increases, the volume
   (a) Increases
   (b) Decreases
   (c) Remains the same
   (d) First increases and then decreases

v. In the element ${}^{23}_{11}Na$, 11 represents
   (a) Mass number
   (b) Atomic number
   (c) Number of neutrons
   (d) None of the above [5]

Section II (40 Marks)

Attempt any **four** questions from this section.

Question 2

(a) How does the Modern atomic theory contradict and correlate with Dalton's atomic theory? [5]

(b) Classify the following as homogeneous or heterogeneous and give one example of each:

i. Solid–Solid
ii. Solid–Liquid
iii. Gas–Gas
iv. Liquid–Liquid
v. Gas–Solid [5]

Question 3

(a) State which of the following are oxidised or reduced?

i. $S^{2-} \rightarrow S$
ii. $Cl^{-} \rightarrow Cl$
iii. $Mn^{5+} \rightarrow Mn^{7+}$
iv. $Cl_2 \rightarrow Cl^{-}$
v. $Cr^{7+} \rightarrow Cr^{5+}$

[5]

(b) Give the assumptions of the kinetic molecular theory. [4]

(c) What is a photochemical reaction? Give one example. [1]

Question 4

(a) Water is purified for scientific purposes by distillation. Describe the process. [5]

(b) Differentiate between deliquescent substances and hygroscopic substances. [2]

(c) State whether the following statements are True or False.

i. The formation of new substance is a chemical change.
ii. Sodium reacts moderately with cold water.
iii. Copper displaces hydrogen from dilute acids.
iv. Sodium chloride is a deliquescent salt.
v. Sodium oxide dissolves in water.
vi. Inter molecular spaces in gases are very small. [3]

Question 5

(a) Choose the odd one out from the following:

i. He, Ne, H, Kr
ii. Na, Rb, Fr, Ca
iii. F, At, Cl, Si
iv. Si, C, Al, Ge
v. K, Zr, Hf, Ti
vi. Fe, Cu, Ge, Zn [3]

(b) Identify the element present in the following groups and periods:

i. Group 1, Period 5
ii. Group11, Period 4
iii. Group16, Period 2
iv. Group 17, Period 3
v. Group 18, Period 4
vi. Group 2, Period 3 [3]

(c)

i. Density of water varies with temperature. What are its consequences?
ii. A solid is crystalline, has a high melting point and is water soluble. Describe the nature of the solid.

[4]

Question 6

(a) Elements A, B, C and D have atomic numbers 8, 9, 11 and 12, respectively.

i. Write the electronic configurations of the elements.
ii. Choose the electropositive and electronegative elements from the above elements.

[3]

(b) Explain distribution of electrons in orbits. [5]

(c) In the laboratory, hydrogen is not prepared by the reaction of lead with dilute sulphuric acid or dilute hydrochloric acid. [2]

Question 7

(a) Fill in the blanks:

i. Nitric oxide is _____ toxic.
ii. The gaseous material which envelopes the Earth is called _____.
iii. The lowest region of the atmosphere is called _____.
iv. The stratosphere mainly contains _____, _____ and ozone.
v. Rain water containing H_2SO_4 and HNO_3 is called _____. [5]

(b) 1 atmosphere =_____ cm. Hg =_____ mm Hg. [2]

(c) At constant temperature, a gas occupies a volume of 2000 cm^3 at a pressure of 740 mm of mercury. At what pressure will its volume be 500 cm^3? [3]