ICSE Board
Class IX Chemistry
Paper - 6

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) Deduce the molecular formula of the following conversions:
   i. Potassium dichromate
   ii. Lead chromate
   iii. Calcium silicate
   iv. Sodium hypochlorite
   v. Sodium plumbate [5]

(b) Explain the following
   i. Electrovalent compounds conduct electricity in molten or aqueous state.
   ii. Electrovalent compounds have high melting and boiling points, while covalent compounds have low melting and boiling points.
   iii. Electrovalent compounds dissolve in water, whereas covalent compounds do not.
   iv. Electrovalent compounds are usually hard crystals yet brittle.
   v. Polar covalent compounds conduct electricity. [5]

(c) Write the electronic configuration of element 17T^{35}.
   i. What is the group number of T?
   ii. What is the period number of T?
   iii. How many valence electrons are there in an atom of T?
   iv. What is the valency of T?
   v. Is it a metal or non-metal? [5]
(d) Balance the following equations:
   i. $\text{NH}_3 + \text{Cl}_2 \rightarrow \text{NH}_4\text{Cl} + \text{N}_2$
   ii. $\text{CaOCl}_2 + \text{NH}_3 \rightarrow \text{CaCl}_2 + \text{N}_2 + \text{H}_2\text{O}$
   iii. $\text{PbS} + \text{O}_2 \rightarrow \text{PbO} + \text{SO}_2$
   iv. $\text{Fe}_2\text{O}_3 + \text{CO} \rightarrow \text{Fe} + \text{CO}_2$
   vi. $\text{C} + \text{HNO}_3 \rightarrow \text{CO}_2 + \text{NO}_2 + \text{H}_2\text{O}$

(e) Give reasons:
   a. Physical properties of isotopes are different.
   b. Argon does not react.
   c. Actual atomic mass is greater than mass number.
   d. $^{35}\text{Cl} \text{ and } ^{37}\text{Cl} \text{ do not differ in their chemical reactions.}$

(f) Give the valency and the formula of the following radicals:
   i. Thiosulphate
   ii. Iodide
   iii. Chromate
   iv. Manganate
   v. Hypochlorite

(g) Convert the following temperature (in °C) to the Kelvin temperature.
   i. $-100^\circ\text{C}$
   ii. $273^\circ\text{C}$
   iii. $20^\circ\text{C}$
   iv. $5^\circ\text{C}$
   v. $10^\circ\text{C}$

(h) Fill in the blanks:
   i. Gases have _______ density.
   ii. Nitric oxide is _______ toxic.
   iii. Full form of CFC is _______.
   iv. Ozone absorbs the harmful _______ rays coming from the Sun.
   v. The 'K shell' can accommodate a maximum of _______ electrons.
SECTION II (40 Marks)

Attempt any four questions from this section.

Question 2
(a) Explain what you understand from the following diagram:

(b) Explain the permutit method for softening hard water.

(c) According to the activity series, which of the following can successfully displace hydrogen?
K/Na/Pb/Ag/Pt/Fe/Al

Question 3
(a) Explain the Bohr’s model of an atom. What is the maximum number of electrons which can be accommodated in
i. K-shell
ii. L-shell
iii. M-shell
iv. N-shell

(b) How are the elements with variable valency named? Explain with an example.

(c) Give two differences between a deliquescent substance and a hygroscopic substance.

Question 4
(a) Write a brief note on the discovery of cathode rays. Draw a neat labelled diagram of a cathode ray tube.

(b) Under what conditions can hydrogen be made to combine with
i. Nitrogen
ii. Chlorine
iii. Sulphur
iv. Oxygen
Name the products in each case and write the equation for each reaction.
Question 5
(a) Define group and period.

i. Name the elements present in Group 1 sequentially.

ii. Name the first and last element present in Group 17.

iii. Name the first and last element of Period 2.

v. In the periodic table, the vertical lines are called groups and the horizontal lines are called periods.

(b) Explain the manufacture of hydrogen gas by electrolysis of water.

Question 6
(a) What are the merits of Mendeleev’s periodic table?

(b) Give reasons.

i. An atom is electrically neutral.

ii. Mass of an atom is concentrated inside the nucleus of an atom.

iii. Atom as a whole is an empty space.

iv. Hydrogen was previously used in meteorological balloons.

v. Hydrogen is no longer used in meteorological balloons.

Question 7
(a) Moist nitrogen at a pressure of 700 mmHg and a temperature of 27°C is found to occupy a volume of 100 cm³. Find the volume of dry nitrogen gas at STP (Aqueous tension at 27°C is 15 mmHg).

(b) At a constant temperature, a gas at a pressure of 750 mm of mercury occupies a volume of 100 cm³. If the volume is decreased by 40%, find the new pressure.

(c) State the law of conservation of mass. Describe its experimental verification.