ICSE Board
Class IX Chemistry
Paper - 7

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

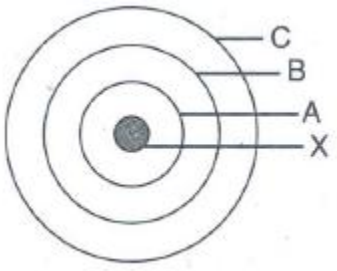
(a) Correct the following statements.

i. A molecular formula represents an element.
ii. The molecular formula of water (H_2O) represents 9 parts by mass of water.
iii. A balanced equation obeys the law of conservation of mass and so does an unbalanced equation.
iv. A molecule of an element is always monoatomic.
v. CO and Co both represents cobalt.

[5]

(b) In the given figure,

i. Name the shells denoted by A, B, and C. Which shell has least energy?
ii. Name X and state the charge on it.
iii. The above sketch is of …….. model of an atom.



[5]

(c) Deduce the molecular formula of the following compounds:

i. Ammonium dichromate
ii. Lead nitrate
iii. Ferrous chloride
iv. Ferric chloride
v. Zinc sulphate [5]

(d) An element 'M' has three electrons more than the noble gas. Give the formula of its

i. Chloride
ii. Sulphate
iii. Hydroxide
iv. Phosphate
v. Oxide

(NOTE: Do not identify the element.) [5]

(e) Give the valency and the formula of the following radicals:

i. Sulphate
ii. Sulphite
iii. Sulphide
iv. Carbonate
v. Ammonium [5]

(f) State the type of reaction:

i. $MnO_2 + 4HCl \rightarrow MnCl_2 + Cl_2 + 2H_2O$
ii. $Zn(NO_3)_2 + 2NaOH \rightarrow Zn(OH)_2 + 2NaNO_3$
iii. $(NH_4)_2Cr_2O_7 \rightarrow N_2 + 4H_2O + Cr_2O_3$
iv. $2Na + Cl_2 \rightarrow 2NaCl$
v. $2AgNO_3 + Cu \rightarrow Cu(NO_3)_2 + 2Ag$ [5]

(g) Give electron dot diagram of the following:

i. Magnesium chloride
ii. Nitrogen
iii. Methane
iv. Hydrogen chloride [5]

(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) Name the sub-atomic particle whose charge is
   i. +1
   ii. −1
   iii. 0 [2]

(b) Write balanced chemical equations:
   i. Decomposition of copper nitrate
   ii. Thermal dissociation of phosphorus pentachloride
   iii. Magnesium burns in oxygen
   iv. Hydrogen burns in air or oxygen
   v. Carbon dioxide is passed through lime water [5]

(c) Why does the temperature of boiling water not rise even when heat is continuously supplied to it? [3]

Question 3

(a) Fill in the blanks.

i. When zinc carbonate is heated, the residue is _____ which is _____ when hot.
ii. When sodium nitrate is heated, the gas evolved is _____.
iii. When a piece of calcium is dropped in water, it becomes cloudy after some time due to the formation of _____.
iv. Hydrogen chloride is a _____ compound.
v. The 'K shell' can accommodate a maximum of _____ electrons. [5]

(b) Give examples in which physical and chemical changes occur simultaneously. [3]

(c) What is a photochemical reaction? Give one example. [2]

Question 4

(a) Select metals from the given list and match them with the statements given below.

Calcium, Sodium, Gold, Aluminium, Potassium

i. Reacts vigorously with cold water to liberate hydrogen
ii. Burns with a golden yellow flame
iii. Burns with a golden yellow flame
iv. Dissolves in aqua regia
v. Reacts with both acids and alkalis to liberate hydrogen [5]

(b) Describe the discovery of anode rays with the help of a labelled diagram. [5]

Question 5

(a)

i. Arrange the elements of the halogen family in an increasing order of the number of shells.
ii. Arrange the elements of the 2nd period in the decreasing order of valence electrons.
iii. What type of bond formation exists between the elements of Group 1 and 17? Why?
iv. Name all the elements present in Group 1 and 17. [5]

(b) Answer the following questions related to the long form of the periodic table.

i. State the modern periodic law.
ii. In which group are halogens placed in the long form of the periodic table?
iii. In the long form of the periodic table, the elements are arranged in the ascending order of _____.
iv. The number of shells is equal to the number of _____.
v. The _____ metals are present in Group 1 of the periodic table. [5]

Question 6

(a) The following questions are related to the manufacture of hydrogen gas by the Bosch process.

(i) Give the equation for the preparation of water gas.

(ii) Why does the temperature of charcoal fall during the formation of water gas? [5]

(b) What will be the reaction between metals such as magnesium and aluminium with hot water or steam? [5]

Question 7

(a) A gas is enclosed in a vessel at standard temperature. At what temperature will the volume of a gas enclosed be $\frac{1}{6}$th of its initial volume at constant pressure? [3]

(b) Carbon dioxide occupies a volume of 336 cm^3 at STP. Find its volume at 20°C and a pressure of 700 mmHg. [2]

(c)

i. A steel cylinder of internal volume 20 litres is filled with hydrogen at 29 atmospheric pressure. If hydrogen is used to fill a balloon at 1.25 atmospheric pressure at the same temperature, what volume will the gas occupy?

ii. A cylinder of 20 litres capacity contains a gas at 100 atmospheric pressure. How many flasks of 200 cm^3capacity can be filled from it at 1 atmosphere pressure, temperature remaining constant?

[5]