BOYS' HIGH SCHOOL AND COLLEGE
FINAL TERM EXAMINATION (2024-25)
CLASS - IX
CHEMISTRY (SCIENCE PAPER-2)

Estd. 1861

TIME-2HOURS   **MM: 80**

*Attempt **all** questions from Section A and 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 answer from the given alternatives-   **[15]**

(i)   Which is not a greenhouse gas?
       (a) Carbon monoxide   (b) Methane   (c) Nitrous oxide   (d) Carbon dioxide

(ii)   In water, the hydrogen-to-oxygen mass ratio is
       (a) 1:8   (b) 1:16   (c) 1:32   (d) 1:64

(iii)   The chemical which is not responsible for acid rain:
       (a) HNO_3 (b) H_2SO_4 (c) H_2CO_3 (d)$HCOOH$

(iv)   Which of the following is a deliquescent salt?
       (a) $CuSO_4$ (b) $FeCl_3$ (c) KCl (d) $ZnSO_4$

(v)   Which chemical is responsible for the destruction of ozone layer:
       (a) CFCs   (b) Carbon monoxide   (c) Water vapour   (d) Carbon dioxide

(vi)   The absolute temperature value that corresponds to 27ºC
       (a) 200K   (b) 300K   (c) 400K   (d) 246K

(vii) If P is doubled for a fixed mass of a gas, its volume will become: -
       (a) 4 times   (b) No change   (c) 2 times   (d) half times

(viii) V-T relationship is given by-
       (a) Dalton   (b) Gay-Lussac   (c) Boyles   (d)Charles

(ix)   The SI unit of pressure is-
       (a) Pascal   (b) in cm of Hg   (c) torr   (d) bar

(x)   Which oxide of nitrogen is responsible for acid rain is:
       (a) Nitric oxide   (b) Nitrous oxide   (c) Nitrogen dioxide   (d) all of these

(xi)   At what temperature will the volume of a gas at 0ºC be tripled? (if pressure remains constant)
       (a) 819ºC   (b) 273ºC   (c) 546ºC   (d) 1082ºC

(xii) A metal which is red hot state reacts with steam to form hydrogen, such that reaction is reversible:
       (a) Mg   (b) Al   (c) Fe   (d) Zn

(xiii) All the members of group 15 have__ electrons in their outermost orbit.
       (a) 3   (b) 5   (c) 7   (d) 4

(xiv) Which of the following is not a non-polar covalent molecule?
       (a) Chlorine   (b) Water   (c) Ammonia   (d) Hydrogen chloride

(xv)   The gradual rise in the average temperature of atmosphere due to emission of gases by industrial Activities is called
       (a) Global warming   (b) Air pollution   (c) Greenhouse effect   (d) Air degradation

Question 2.

i.   **Fill in the blanks:**   **[5]**
a) If the temperature is reduced to half, the _____ would be also reduced by half.
b) Ozone layer prevent the harmful _____ radiation of the sun to react earth's surface.
c) During thunder and lightning, the atmospheric oxygen and nitrogen gets combined to form ____ gas.
d) Gases neither have a definite _____ nor a fixed _____.
e) 100K is equal to ___ºC.

ii.   **Match the items in column I with those in column II-**   **[5]**

Column I	Column II
1. Volume	a. Kelvin
2. Boyle's law	b. Cubic centimetre
3. Pressure	c. torr
4. Chales' law	d. PV = k
5. Temperature	e. $V_1T_2 = V_2T_1$

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iii.   State the following: [5]
    a. Gas Equation
    b. Boyle's law equation
    c. Charle's law equation
    d. Standard pressure value
    e. Standard temperature value
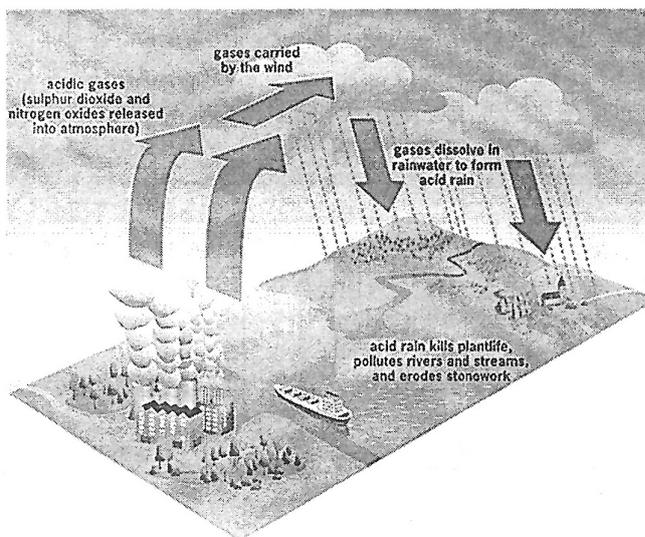
iv.   Write two example for each question: [5]
(a)   Natural sources of air pollution
(b)   Greenhouse gases
(c)   Particulate pollutants
(d)   Man- made sources of air pollution
(e)   Chemicals responsible for depletion of ozone layer

v.   **Look at the following figure and answer the following question:**   [5]

a.   Which **phenomenon** is depicted in this figure and mention the cause of it.
b.   List two ways by which you can **reduce** it from happening.
c.   Describe the formation of **Sulphuric acid**, including the chemical reactions involved?

Section B (40 Marks)
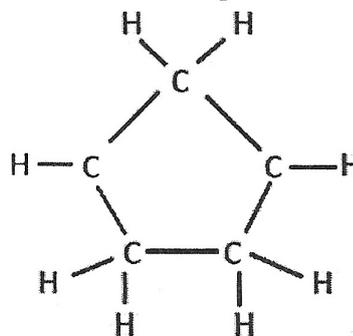*(Attempt any four questions from this Section.)*

Question 3
i. Define **gaseous state**.   [2]
ii. Explain **decomposition reaction** with example.   [2]
iii. Explain mechanism of **greenhouse effect**. Suggest two ways to reduce **global warming.**   [3]
iv. The following figure represent the **structural formula** of compound.   [3]

Answer the question given below:
a. Write the **molecular formula** of the compound
b. Calculate the **percentage composition** of all the elements present in the compound.
[At wt. of C =12, H =1]

Question 4

i   **Ionic compounds** are very stable. Give reason. [2]

ii. What will be the **volume** of a gas when 3 liters of it is cooled down from 27°C to -73°C at constant pressure. [2]

iii. Describe the step- by-step formation of **nitric acid** in acid rain, including the chemical reactions involved. [3]

iv. Explain the **factors** which affect **solubility**. [3]

Question 5

i.   Find the percentage mass of **water** in **washing soda** crystals ($Na_2CO_3.10H_2O$).
     [Atomic weight Na =23, C =12, O =16, H =1] [2]

ii. What are the **consequences** of **acid rain**. [2]

iii. Explain any three **characteristic properties** of gases. [3]

iv. Name the following with reference to the elements of modern periodic table: [3]
     a) **Noble gas** with **duplet** arrangement of electrons
     b) **Metalloid** in period **3**
     c) **Metal** having electronic configuration: **2,8,8,2**
     d) **Alkaline earth metal** in Period **3**
     e) Group whose elements have **valency -1**
     f) A **covalent** compound formed by an element in Period 2 and a halogen.

Question 6

i.   Define **greenhouse gases**. [2]

ii. **Hydrogen** can be collected from heated **metals**, when **steam** is passed over them.
     Name **two** such metals and write **balanced chemical equations** in support of your answer. [2]

iii. Give an example (chemical reaction) for following: [3]
     a. **Photochemical** reaction
     b. **Electrochemical** reaction
     c. **Neutralization** reaction

iv. Define **Boyle's Law**. Solve the following: [3]

     The **volume** of a given mass of a gas with some pieces of marble in container at **750mm Hg pressure** is **100ml**. If the pressure is changed to **1000mm Hg**, the new volume is **80ml**. Find the **volume** occupied by the marble pieces, if the temperature remains constant.

Question 7

i.   Define **absolute zero** and explain it with help of mathematical equation. [2]

ii. Explain: [2]
     a. What would you observe when crystals of **copper (II) sulphate** are heated in test tube strongly.
     b. What is the effect of **temperature** on solubility of KNO_3 in water?

iii. Explain: [3]
     a. **formation** of ozone
     b. **function** of ozone
     c. **depletion** of ozone layer

iv. **P, Q** and **R** are metals. Q liberates hydrogen from **cold water**, whereas P and R do not.
     R displaces P from an aqueous solution of one of its salts. [3]
     a) Place **P, Q** and **R** in the order of decreasing reactivity.
     b) If **QCl** is the formula of a **chloride**, what will be the formula of its **hydroxides** and **sulphate**.

Question 8

i.   Describe any two defects in Mendeleev periodic table. [2]

ii. What are the effects of **global warming**. [2]

iii. Draw atomic structure of all the **isotopes of carbon**. [3]

iv. Solve: [3]
     At 0°C and **760mm Hg pressure**, a gas occupies a volume of **100cm³**. Kelvin temperature of the gas is increased by **one-fifth** and the pressure is increased to **one and a half times**.
     Calculate the final volume of the gas.

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