



## ST. JOSEPH'S COLLEGE, PRAYAGRAJ

FINAL EXAMINATION 2024

CLASS - IX

SUBJECT- CHEMISTRY

Time: 2 Hrs

Max. Marks: 80

### SECTION A

( Attempt all questions from this section)

#### Question 1

Choose one correct answer to the questions from the given options:

[15]

(i) Which of the statement(s) about the reaction given below is/are incorrect?



- P. Lead is getting reduced.
- Q. Carbon dioxide is getting oxidised.
- R. Carbon is getting oxidised.
- S. Lead oxide is getting reduced.

- (a) P and Q
- (b) Only R
- (c) Only S
- (d) P and R

(ii) The impurity Carbon monoxide formed during the manufacturing of hydrogen gas is removed by?

- (a) CaO
- (b) Ammonical CuCl solution
- (c) CuO
- (d) CuSO<sub>4</sub> solution

(iii) A reaction which gives out heat is a/ an \_\_\_\_\_ reaction.

- (a) Combination
- (b) Endothermic
- (c) Exothermic
- (d) Electrochemical

(iv) Which of the following is an ionic compound?

- (a) CCl<sub>4</sub>
- (b) MgF<sub>2</sub>
- (c) CH<sub>4</sub>
- (d) NH<sub>3</sub>

(v) Octet rule is not valid for ?

- P. Lithium
- Q. Hydrogen
- R. Sodium
- S. Magnesium

- (a) Both Q & R
- (b) Both P & Q
- (c) Both R and S
- (d) Both P & S



- (vi) The number of neutrons in O-16 and O-18 isotopes are-  
(a) O-16 > O-18      (b) O-18 > O-16      (c) O-16 = O-18      (d) zero
- (vii) The type of reaction which takes place between red hot Iron and steam-  
(a) Irreversible reaction      (b) Reversible reaction  
(c) Photochemical reaction      (d) Electrochemical reaction
- (viii) The value of standard temperature in Kelvin is -  
(a) 273 K      (b) -273 K  
(c) 273<sup>o</sup> C      (d) ~~273 K~~ - 273<sup>o</sup> C
- (ix) **Assertion:** "The volume of a given mass of a dry gas is directly proportional to its absolute temperature, if the pressure remains constant".  
**Reason:** When the temperature of a gas is increased, the particles( molecules) move faster.
- (a) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.  
(b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.  
(c) Assertion is true but Reason is false.  
(d) Assertion is false but Reason is true.
- (x) The metal which does not form an amphoteric oxide-  
(a) Aluminium  
(b) Zinc  
(c) Lead  
(d) Sodium
- (xi) According to Dobereiner's triads, the first element (X) and the third element (Z) have atomic masses 40 and 137 respectively. The atomic mass of the middle element (Y) in a triad is -  
(a) 80.5  
(b) 40.5  
(c) 88.5  
(d) 86.5
- (xii) Digestion of the food by our body is an example of -  
(a) Combination reaction  
(b) Displacement reaction  
(c) Double displacement reaction  
(d) Decomposition reaction



(xiii) The mathematical expression for Charle's law is given as -

- (a)  $P_1V_1 = P_2V_2$
- (b)  $V_1/P_1 = V_2/P_2$
- (c)  $V_1/T_1 = V_2/T_2$
- (d)  $T_1/P_1 = T_2/P_2$

(xiv) In the Bohr-Bury scheme, the maximum possible number of electrons present in third (M) shell of an atom are ?

- (a) 2 electrons
- (b) 8 electrons
- (c) 18 electrons
- (d) 32 electrons

(xv) **Assertion:** "When someone is stung by a bee, baking soda is rubbed on the spot, as the baking soda is basic in nature".

**Reason:** The reaction between an acid and a base forms salt and hydrogen gas only is referred to as a neutralisation reaction.

- (a) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.
- (b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
- (c) Assertion is true but Reason is false.
- (d) Assertion is false but Reason is true.

## Question 2

(i) Complete the following by choosing the correct answer from the bracket [5]

- (a) Chromium oxide has two radicals in which chromium is a \_\_\_\_\_ radical (acidic/ basic).
- (b) The name of the element  ${}_1^3\text{H}$  atom is \_\_\_\_\_ (tritium / tellurium).
- (c) Moving across a period of the periodic table, the elements show increase in \_\_\_\_\_ (metallic/ non-metallic) character.
- (d) The hydrogen gas formed during its laboratory preparation is \_\_\_\_\_ (lighter/ heavier) than air.
- (e) The law of octaves was given by \_\_\_\_\_ (Mendeleev/ Newland)

(ii) Define the following- [5]

- (a) Global warming
- (b) Group
- (c) Electronic configuration
- (d) Absolute zero
- (e) Nucleon

(iii) What do you observe when-

[5]

- (a) Blue vitriol is heated in a test tube.
- (b) Ammonia gas is passed through Nessler's reagent.
- (c) Cobalt chloride paper is introduced in water vapour.
- (d) Ammonium dichromate is heated in a test tube.
- (e) A solution of potassium iodide is added to lead nitrate solution.

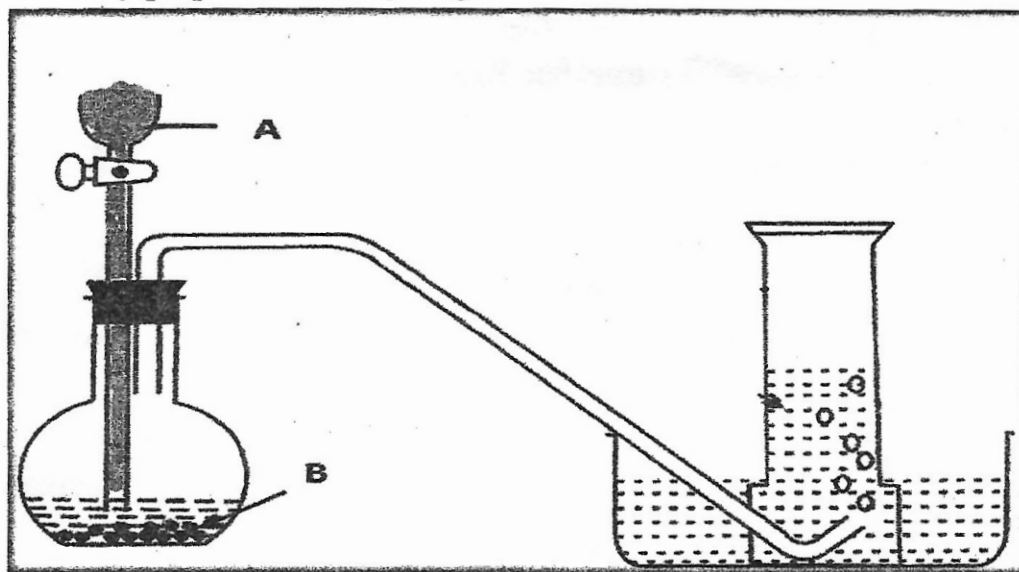
(iv) Balance the following equations-

[5]

- (a)  $Mg_3N_2 + H_2O \longrightarrow Mg(OH)_2 + NH_3$
- (b)  $MnO_2 + HCl(aq) \longrightarrow MnCl_2 + 2H_2O + Cl_2$
- (c)  $NH_3 + O_2 \longrightarrow N_2 + H_2O$
- (d)  $NO_2 + H_2O \longrightarrow HNO_2 + HNO_3$
- (e)  $CaCO_3 + HCl(dil) \longrightarrow CaCl_2 + H_2O + CO_2$

(v) Study the diagram and answer the following questions with reference to the laboratory preparation of hydrogen-

[5]



- a. Name the reactants A and B.
- b. Write the balanced chemical equation involved.
- c. Which reagent is used to remove the following impurities formed during its preparation-
  - a. Arsine and Phosphine
  - b. Hydrogen sulphide
- d. How is the gas collected?
- e. How is the pure hydrogen gas tested?



## SECTION B

( Attempt any four questions )

### Question 3

- (i) What is the valency of - [2]
- Fluorine in  $\text{CaF}_2$
  - Phosphorous in  $\text{PH}_3$
  - Nitrogen in  $\text{NO}_2$
  - Carbon in  $\text{CCl}_4$
- (ii) Give reason- [2]
- Gases have great tendency to diffuse.
  - Inert gases are monoatomic.
- (iii) Draw an orbital diagram of the following. Also, state the type of bonding present between the combining elements in the given compound. [3]
- Calcium oxide
  - Ammonia
- (iv) It is found, on heating a gas, its volume increases by 50% and pressure decreases to 60% of its original value. If the original temperature was  $-15^\circ\text{C}$ , find the temperature to which it was heated? [3]

### Question 4

- (i) Give the chemical <sup>formulas</sup> names of the following compounds- [2]
- Sodium Permagnate
  - Calcium sulphite
  - Aluminium carbonate
  - Calcium nitride
- (ii) Name- [2]
- Two carbonates that do not produce carbon dioxide on heating.
  - A greenish yellow gas.
- (iii) Give reason- [3]
- Granulated zinc is used in the laboratory preparation of the hydrogen.
  - It is necessary to specify the pressure and temperature of a gas while stating its value.
  - Rain water have pH less than 7.



- (iv) How would you carry out the conversions( Write balanced chemical equations). [3]
- Hydrogen to a neutral liquid.
  - Hydrogen to a basic gas.
  - Hydrogen to an acidic gas.

## Question 5

- (i) State the variable valencies of the following elements and give their names. [2]
- Ag
  - Pb
- (ii) What are greenhouse gases? How are greenhouse gases responsible for the global warming? [2]
- (iii) Differentiate between the following- [3]
- Electrovalent and covalent bonding.
  - Combination reaction and decomposition reaction.
  - Mendeleev's periodic law and Modern periodic law.
- (iv) An element X ( atomic number 17) reacts with an element Y ( atomic number 20) to form a divalent halide. [3]
- Where in the periodic table are elements X and Y placed?
  - Classify X and Y as metal(s), non-metal(s) and metalloid(s).
  - Identify the nature of the bonding in the compound formed.

## Question 6

- (i) The formula of the sulphate of a metal is  $XSO_4$ . State the formula of its- [2]
- nitride
  - hydroxide
- (ii) What are the causes of Acid rain? [2]
- (iii) Give a chemical test to distinguish between the following gases/ compounds- [3]
- NaCl and KCl
  - $H_2S$  and  $SO_2$
  - $CO_2$  and  $SO_2$
- (iv) Identify the elements with the following information given below and **arrange them in the increasing order of their reactivity.** [3]
- An element which is a soft and reactive metal.
  - The metal which is an important constituent of limestone.
  - A metal used as a reactant in the laboratory preparation of the Hydrogen.
  - An element placed in group IA and period 1.



## Question 7

- (i) Calculate relative molecular mass of - [2]
- Ammonium nitrate
  - Calcium chloride
- (given RAM is N=14, H=1, O=16, Ca=40, Cl=35.5)
- (ii) 800cm<sup>3</sup> of gas is collected at 654mm pressure. At what pressure would the volume of the gas reduce by 40% of its original volume, temperature remaining constant. [2]
- (iii) Compare hydrogen and halogens on the basis of - [3]
- Electronic Configuration
  - Ion formation
  - Valency
- (iv) a. What is the function of ozone in the atmosphere? [3]
- b. With the help of chemical equation, explain the formation of ozone in the atmosphere?

## Question 8

- (i) Calculate the percentage composition of - [2]
- Zinc in zinc carbonate
  - Calcium in calcium sulphate
- ( given RAM is Zn=65, C=12, O=16, Ca=40, S=32)
- (ii) State whether the underlined species are oxidised or reduced- [2]
- Fe<sup>3+</sup> + 1e<sup>-</sup> → Fe<sup>2+</sup>
  - Al → Al<sup>3+</sup> + 3e<sup>-</sup>
  - S<sup>4+</sup> - 2e<sup>-</sup> → S<sup>6+</sup>
  - Na<sup>+</sup> + e<sup>-</sup> → Na
- (iii) Answer the following questions- [3]
- State the Boyle's law.
  - A given mass of a gas occupies 143cm<sup>3</sup> at 27<sup>0</sup>C and 700mm Hg pressure. What will be its volume at 300K and 280mm Hg pressure?
- (iv) Copy and complete the following blanks in the given table on the basis of manufacturing of hydrogen gas. [3]

Name the process	Balanced chemical reaction involved	Impurities formed
A) -----	B) C + H <sub>2</sub> O $\xrightarrow{1000^{\circ}\text{C}}$ (CO + H <sub>2</sub> ) - heat C) -----	D) ----- E) -----