FINAL EXAMINATION 2024 - 2025

Std. IX Date : 18/02/2025 Sub : Chemistry Time : 2 hours Marks : 80

Answer to this paper must be written on the paper provided separately.

You will NOT be allowed to write during the first 10 minutes.

This time is to be spent in reading the question paper.

The time given at the head of this paper is the time allowed for writing the answer.

The intended marks for questions or parts of questions, are given in brackets [ ]

SECTION A[40 MARKS]

ALL QUESTIONS IN THIS SECTION ARE COMPULSORY

Question 1

A) Choose the correct answer from the given set of options: [15]

i) When electric current is passed through acidulated water, it decomposes into -

a) Hydrogen and Oxygen atom b) Oxygen c) Effervescence d) Hydrogen and Oxygen gas

ii) The reaction, $2Cu(NO_3)_2 \rightarrow 2CuO + 4NO_2 + O_2$ is an example of a/an

a) Decomposition reaction b) Photochemical decomposition reaction

c) Electrochemical decomposition reaction d) Simple displacement reaction

iii) A solid element showing variable valency?

a) Magnesium b) Sodium c) Lead d) Calcium

iv) A solution made by dissolving a substance in water is called _____ solution.

a) Aqua b) Aquatic c) Aqueous d) Aquasol

v) Laboratory prepared hydrogen is collected by downward displacement of -

a) A basic oxide b) An acidic oxide c) An inert gas d) A neutral oxide

vi) Which of the following is true about a covalent bond?

a) It is formed between 2 metals b) It is formed due to the transfer of electrons

c) It results in the formation of a cations d) It is formed due to the sharing of electrons

vii) Which of the following observations does not take place when Blue vitriol is heated?

a) It loses its colour b) It turns into a black solid

c) It loses its crystalline structure d) It turns into a dry powder.

viii) The formula for Epsom salt is

a) $MgSO_4.3H_2O$ b) $MgSO_4.5H_2O$ c) $MgSO_4.7H_2O$ d) $MgSO_4.9H_2O$

ix) Identify the covalent compound from the following:

a) KCl b) $MgCl_2$ c) $AlCl_3$ d) CCl_4

x) Answer questions x)-xv) using the information given below (Please note: the symbols used here are not the actual symbols of the elements)

$_{17}T^{37}$, $_{5}U^{11}$, $_{9}V^{19}$, $_{17}W^{35}$, $_{18}X^{39}$, $_{20}Y^{39}$, $_{16}Z^{33}$

x) The most reactive element is _____

a) X b) Y c) Z d) None of the above

contd..2

xi) The element with 16 electrons, 16 protons and 17 neutrons is _____
a) T b) Z c) V d) W

xii) An element with 0 valency is _____
a) U b) Y c) Z d) X

xiii) The element with highest number of electrons in the outermost shell is _____
a) X b) Y c) Z d) T

xiv) Formula of the compound formed between Z and U is _____
a) Z_3U_2 b) U_3Z_2 c) U_2Z_3 d) Z_2U_3

xv) Which elements have similar chemical properties?
a) U and T b) U and V c) V and W d) T and W

B) i) Find the Relative molecular mass of Sodium carbonate (Na=23, C=12, O=16) [3]
ii) Draw the Lewis dot structures for $MgCl_2$ [3]
iii) Draw the orbital diagram of the following: [4]
a) Calcium (A=40) b) Nitrogen (A=14)

Question 2

A. i) Give relevant observations for the following; [5]
a) Sodium metal is introduced to a flame
b) A crystalline salt is heated
c) Action of steam on Aluminium
d) Hydrogen is collected over Air
e) Concentrated Sulphuric acid is kept near a moist gas.

ii) Define the following: [5]
1. Deliquescence 2. Valency 3. Absolute zero 4. Chemical bond
5. Efflorescence

iii) Balance the following reactions: [5]

1. $KI + H_2O_2 \rightarrow KOH + I_2$
2. $Fe + H_2SO_4 \rightarrow Fe_2(SO_4)_3 + H_2$
3. $Cl_2 + NH_3 \rightarrow N_2 + HCl$
4. $Al(OH)_3 + HNO_3 \rightarrow Al(NO_3)_3 + H_2O$
5. $KNO_3 + H_2SO_4 \rightarrow K_2SO_4 + HNO_3$

Section B

(Attempt any 4 complete questions from this section – 40 marks)

Question 3

A] Answer the following based on the Modern Periodic Table: [3]
(i) Metalloid in Period 2.
(ii) Noble gas with duplet arrangement of electrons.
(iii) A covalent compound formed by an element in Period 2 and a halogen.

Contd..3

B] Element P has atomic number 16. To which group and period, does P belong? Is it a metal or a non - metal? Why? [3]

C] Write balanced chemical equations for the following: [4]
(i) Red hot iron reacts with steam.
(ii) Zinc reacts with hot and concentrated potassium hydroxide.
(iii) Magnesium reacts with dilute hydrochloric acid.
(iv) Calcium reacts with cold water.

Question 4

A] 800 cm^3 of a gas is collected at 654 mm pressure. At what pressure would the volume of the gas reduce by 40% of its original volume, temperature remaining constant? [3]

B] (i) State Charles Law. [1]
(ii) Convert - 45 degree C to K. [1]
(iii) How does temperature affect the molecular motion of a given gas? [1]

C] How would you distinguish between the following pairs of substances on the basis of the chemical tests given in the brackets? [4]
(i) Potassium chloride and calcium chloride (Flame test)
(ii) Zinc sulphide and sodium sulphite (Action of dil. Sulphuric acid)

Question 5

A] The formula of the chloride of a metal 'M' is MCl_3. State the formula with its: [3]
(i) Carbonate (ii) Nitrate (iii) Phosphate

B] (i) Define Solubility. What is the effect of temperature on the solubility of potassium nitrate in water? [2]
(ii) What is the effect of cooling, on a saturated solution? [1]

C] Calculate the percentage composition of each element in a molecule of glucose ($C_6H_{12}O_6$) [4]
(C = 12, H = 1, O = 16)

Question 6

A] Classify each of the following type of chemical reactions: [3]
(i) $2KClO_3 \rightarrow 2KCl + 3O_2$
(ii) $AgNO_3 + NaCl \rightarrow AgCl \downarrow + NaNO_3$
(iii) $NH_3 + HCl \rightarrow NH_4Cl$

B] Metal X was placed in silver nitrate solution. A layer of silver metal deposits on metal X. Which is more reactive, metal X or silver? State the type of reaction and give another example of this type. [3]

C] Answer the following questions based on the lab preparation of hydrogen: [4]
(i) Write a balanced chemical equation for the above preparation.
(ii) Why is the metallic element preferred over other metals?
(iii) Why is nitric acid not used in this preparation?
(iv) How is this gas collected?

Contd..4

✓ **Question 7** [3]

A] Give Reasons:

(i) Carbon - 12 and Carbon - 14 both show similar chemical properties.

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

(iii) Argon does not react.

B] Calculate the volume of the gas 'X' at S.T.P., if it occupies 380 litres at 300 K and 70 cm of Hg. [3]

C] Answer the following questions based on the electrolysis of water: [4]

(i) Why is sulphuric acid added to the water?

(ii) Name the gases collected at the anode and cathode.

(iii) Write the reactions taking place at the cathode.

(iv) Write the reactions taking place at the anode.

✓ **Question 8**

A] (i) Name the industrial process for the preparation of hydrogen. [1]

(ii) Give the endothermic and exothermic reactions involved in the above preparation. [2]

B] Elements P, Q and R have atomic numbers 6, 9 and 12 respectively. Which one: [3]

(i) forms an anion?

(ii) forms a cation?

(iii) has four electrons in its valence shell?

C] Answer the following: [4]

(i) State any two defects of Mendeleev's periodic table.

(ii) State a similarity and a difference between hydrogen and halogens.

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