Estd. 1861

BOYS' HIGH SCHOOL AND COLLEGE
FIRST TERM EXAMINATION (2025-26)
CLASS - IX
CHEMISTRY (SCIENCE PAPER-2)

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 of the following is a correct chemical formula?
(a) $NaCl_2$ (b) $Ca(NO_3)_2$ (c) CO_3 (d) H_2SO_2

(ii) Which of the following is a chemical change?
(a) Melting of ice (b) Breaking of glass (c) Boiling of water (d) Burning of Magnesium ribbon

(iii) Which of the following is a hygroscopic substance?
(a) Quick lime (b) Calcium chloride (c) Epsom salt (d) Caustic soda

(iv) The valency of aluminium is
(a) 1 (b) 2 (c) 3 (d) 4

(v) When barium chloride is mixed with sodium sulphate, the white precipitate formed is of:
(a) $BaSO_4$ (b) NaCl (c) Na_2SO_4 (d) $BaCl_2$

(vi) Pure water is a non-conductor of electricity because
(a)it consists of molecules (b)it has no ions (c) both a & b (d) none of these

(vii) The number of atoms in one molecule of sulphuric acid (H_2SO_4) is:
(a) 6 (b) 7 (c) 5 (d) 8

(viii) $N_2+3H_2 \xrightleftharpoons[450°C\text{-}500°C]{Fe,Mo} 2NH_3$
The reaction above is an example of
(a) combination (b) catalytic (c) reversible (d) all of these

(ix) Deliquescent substances on exposure to air turns into
(a) liquid state (b) anhydrous state (c) solution state (d) Charred mass

(x) In $Fe_2(SO_4)_x$, the value of x is:
(a) 1 (b) 2 (c) 3 (d) 4

(xi) Which of the following metals can displace hydrogen from dilute acids.
(a) Silver (b) Mercury (c) Zinc (d) Copper

(xii) The crystalline substance that does not contain water of crystallization
(a) Potash alum (b) Plaster of Paris (c) Gypsum (d)Potassium permanganate

(xiii) Which of these elements is a diatomic molecule in its natural form?
(a) Nitrogen (b) Sodium (c) Neon (d) Magnesium

(xiv) A student added lead nitrate to potassium iodide and observed a yellow precipitate. What type of reaction is this?
(a) Combination (b) Displacement (c) Decomposition (d) Double displacement

(xv) When a sample of water containing dissolved air is gently warmed, the solubility of dissolved air:
(a) Increases (b) Decreases (c) Remains same (d) None of these

Question 2.

i. Fill in the blanks: **[5]**

a) Water changing into water gas is a _____ change.
b) Crystals are separated from a saturated solution by slow _____ of the solvent.
c) The insoluble substance formed by mixing two solutions is known as _____.
d) _____ gas is evolved on thermal decomposition of sodium nitrate.
e) Due to strong _____ of oxygen atom in water molecule, the electron pairs forming the covalent bond are attracted by oxygen and shifted towards it.

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

Column I	Column II
Epsom salt	$ZnSO_4.7H_2O$
Glauber's salt	$Na_2CO_3.10H_2O$
Washing soda crystals	$MgSO_4.7H_2O$
White vitriol	$FeSO_4.7H_2O$
Green vitriol	$Na_2SO_4.10H_2O$

iii. **Write the acidic and basic radicals for the following compounds.** [5]

a. Magnesium sulphate b. Calcium hydroxide c. Ferric chloride
d. Ammonium sulphate e. Sodium nitrate

iv. **Calculate the valency of the underlined atom in the given element.** [5]

a. $\underline{Mn}O_2$ b. $\underline{C}O_2$ c. $K_2\underline{Cr}_2O_7$ d. $\underline{Pb}O_2$ e. $\underline{N}O$

v. **Classify the following changes as combination, decomposition, displacement and double decomposition:** [5]

a. Neutralisation of an acid
b. Burning of sulphur
c. Reaction of iron with copper sulphate solution
d. Heating of mercuric oxide
e. Corrosion of iron

SECTION - B (40 Marks)

*(Attempt **any four** questions from this Section.)*

Question 3

i. Calculate the percentage of **sodium** in Sodium aluminium fluoride (Na_3AlF_6). [2]
[Atomic weight: Na=23, F=19 and Al =27]

ii. Give reason for following: [2]
a. Silver nitrate solution is kept in **colored** bottles.
b. Blue solution of copper sulphate changes to **green** when a piece of iron is added to this solution.

iii. Name and explain the factors which affect the rate of **solubility.** [3]

iv. Explain the different types of **double decomposition** reaction by giving suitable **equations.** [3]

Question 4

i. $(NH_4)_2SO_4.FeSO_4.6H_2O$ is the molecular formula of **Mohr's salt** [2]
a. How many types of **atoms** present in it.
b. Find the **no. of atoms** of each **element.**

ii. Define **efflorescent** and **deliquescent** substances. [2]

iii. Calculate the percentage of water of crystallization in $FeSO_4.7H_2O$ [At. wt: Fe=56, S=32, O=16] [3]

iv. Give **balanced chemical** equation for following: [3]
a. **Sugar** cubes turn **black** when conc. H_2SO_4 is added to it.
b. **Temporary hardness** is removed when water is **boiled.**
c. **Glauber's salt** loses weight when exposed to air for some time.

Question 5

i. Write **chemical name** for following pairs of compounds: [2]
a) **CuO** and Cu_2O
b) **FeO** and Fe_2O_3

ii. Define **saturated solution.** What is the effect of **cooling** on a saturated solution. [2]

iii. Mention two differences between **drying and dehydrating agent** and provide example. [3]

iv. **Define** [3]
(a) **Photochemical** reaction.
(b) **Electrochemical** reaction.
(c) **Thermal decomposition** reaction.

Question 6

i. Define **Valency.** The valency of an element **A** is 3 and that of element **B** is 2. Write the **formula** of the compound formed by the combination of A and B. [2]

ii. What do you **observe** in the following case? [2]
a. **Sodium chloride** solution is added to **silver nitrate** reagent.
b. **Lead nitrate** is heated.

iii. Complete the following table [3]

Anion → Cation↓	Carbonate	Hydroxide	Phosphate
Sodium	$NaCO_3$	NaOH	Na_3PO_4
Ammonium			
Calcium			

iv. Write **chemical formula** for the following: [3]
a. The salt that causes **temporary** hardness
b. The substance that formed by **dehydration of ethanol** (C_2H_5OH)

c. An **efflorescent** substance

Question 7

i. Define **catalytic reaction** by providing chemical equation. [2]

ii. How can you convert an **unsaturated** solution into a **saturated** solution. [2]

iii. Calculate **relative molecular mass** of following: [3]

a. Sodium carbonate

b. Cane sugar

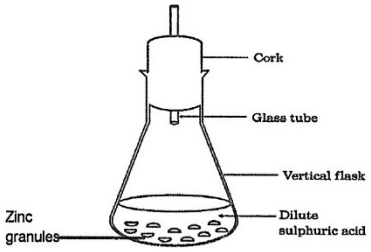
(Atomic mass: Na=23, C=12, O=16 and H=1)

iv. The diagram shows **zinc granules** reacting with **dilute sulphuric acid in a conical flask.** [3]

a. What do you **observe** during the reaction?

b. Write the **balanced chemical equation.**

c. What **type** of **chemical reaction** is this?



Production of hydrogen gas

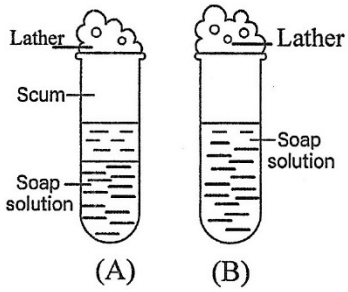
Question 8

i. Write four **characteristics** of chemical reactions. [2]

ii. The diagram shows two test tubes with **equal** amounts of **soap solution added** to **two** different water samples. [2]

a. Which one contains **hard water** and why?

b. Name two salts that cause **permanent hardness.**



iii. Give one example for each of the following [3]

a. **Combination** reaction

b. **Reversible** reaction

c. **Electrolytic** decomposition

iv. **Balance** the following reactions: [3]

a. $MnO_2 + HCl \longrightarrow MnCl_2 + H_2O + Cl_2$

b. $FeCl_3 + NaOH \longrightarrow NaCl + Fe(OH)_3$

c. $KNO_3 \longrightarrow KNO_2 + O_2$

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