Estd. 1861

BOYS' HIGH SCHOOL AND COLLEGE
SECOND TERM EXAMINATION (2024-25)
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) A metal oxide that is reduced by hydrogen is:
(b) Al_2O_3 (b) Na_2O (b) CuO (b) CaO

(ii) Which element does not show variable valency?
(a) Fe (b) Cu (c) Pb (d) Rb

(iii) $NH_4Cl \rightleftharpoons NH_3+HCl$. In this reaction, ammonia is a ____ gas.
(a) Acidic (b) Basic (c)Neutral (d)None of these

(iv) In the periodic table, the elements of a same period have the same:
(a) Mass number (b) Atomic number (c) No. of shells (d) Valence electron

(v) Which of the following is an example of anhydrous substance:
(a) Glauber's salt (b) Quicklime (c) Caustic soda (d)Both b & c

(vi) How many electrons does sodium ion has in its outermost shell?
(a) 1 (b) 8 (c) 2 (d) 6

(vii) Which of the following metal hydroxides is not amphoteric in nature -
(a) Al (b) Zn (c) Pb (d) K

(viii) The mass number of an atom whose tripositive ion has 10 electrons and 14 neutron is
(a) 27 (b) 28 (c) 26 (d)17

(ix) The group _____ elements exist as diatomic in nature
(a) 1 (b) 2 (c) 17 (d) 18

(x) The number of bonds in methane molecule is:
(a) 1 (b) 2 (c) 3 (d) 4

(xi) Which metal gives hydrogen with all of the following: water, acid and alkalis:
(a) Fe (b) Zn (c) Cu (d) Mg

(xii) $FeSO_4$ is the formula for -
(a) Ferrous sulphate (b) Ferric sulphate (c) Iron (III) sulphate (d) None of these

(xiii) The maximum number of electron that N shell can occupy is
(a) 8 (b) 18 (c) 32 (d) 50

(xiv) An endothermic reaction is one that _____ energy in the form of heat or light
(a) Releases (b) Absorbs (c) Heat (d) Changes

(xv) Which acid is a strong oxidizing agent and cannot be used to prepare hydrogen gas?
(a) H_2SO_4 (b) HCl (c) HNO_3 (d) H_2CO_3

Question 2.

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

a) Smaller the particle size of a solute, _____ is the rate of dissolution.
b) A catalyst either _____ or _____ the rate of chemical reaction.
c) The electrons revolve rapidly in a fixed circular path known as _____.
d) Modern periodic table is based on _____.
e) Alkali metals react with water to form their _____ which are strong alkalis.

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

Column I	Column II
1.Permanent Hardness	a. HNO_3
2. Inert gas	b. $Ca(HCO_3)_2$
3. Oxidising agent	c. Br
4. Halogen	d. $CaCl_2$
5. Temporary Hardness	e. Kr

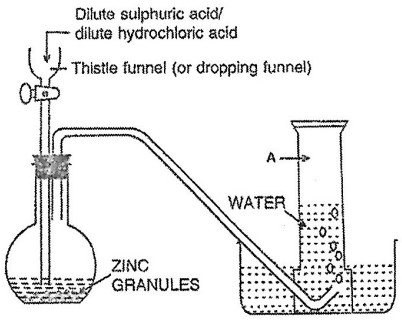
iii. **Complete the following table:** [5]

Element	Symbol	No. of proton	No. of electron	No. of neutron
Helium	He	2	**P**	2
Argon	Ar	18	18	**Q**
Silicon	**R**	14	14	14
Sulphur	S	16	16	**S**
T	F	9	9	10

iv. **Write down an example (chemical formula) for each type:** [5]

(a) Ionic compound
(b) Single covalent compound
(c) Polar molecule
(d) Non-polar molecule
(e) Triple covalent molecule

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



a. Which **gas** is prepared by this method marked as **A**.
b. Why **zinc granules** are preferred for this reaction instead of pure zinc?
c. Why is **nitric acid** not used as a reactant in the above method?
d. **Conc. H_2SO_4** is a good drying agent. However, it is not used here. Why?
e. Which **drying agent** is used to dry the gas?

Section B (40 Marks)

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

Question 3

i. Calculate the percentage of **nitrogen** in **urea (NH_2CONH_2).** [2]
Given: RAM of N = 14, C=12, O=16 and H=1 amu.
ii. Define: a) **Atomic number** b) **Mass number** [2]
iii. Explain **Newland's law of octaves.** Why was the law **discarded**? [3]
iv. Write **balanced** chemical reaction: [3]
If metals **(Mg, Al and Zn)** react with **dilute Sulphuric acid.**

Question 4

i. Define neutralization **reaction** with an example. [2]
ii. Match the given **atomic number 4, 19, 8** and **15** [2]
a) A **solid non-metal** of valency **3.**
b) A **gas** of valency **2.**
c) A **metal** of valency **2.**
d) A **metal** of valency **1.**
iii. Write **three** characteristics of **alkali metals.** [3]
iv. Hydrogen is manufactured by **Bosch process.** Explain it with **conditions** and **equations.** [3]

Question 5

i. Define **water of crystallization** and give two examples of hydrated salt. [2]
ii. Name all the **four** chemicals used in the **purification** of hydrogen gas prepared from granulated **zinc.** [2]
iii. Draw orbit structure of **Nitrogen (N_2)** and **Ammonia (NH_3)** molecule. [3]
iv. An element **A** has **2 electrons** in its **fourth** shell. State: [3]
a) Its atomic number
b) Its electronic configuration
c) Its valency

d) Position in the periodic table
e) Is it a metal or non-metal
f) Is it an oxidizing or reducing agent

Question 6

i. Write the **chemical formula** of following compounds: [2]
a) Calcium phosphate
b) Lead acetate

ii. **Define:** [2]
a) Mendeleev periodic law
b) Modern periodic law

iii. Define **isotopes**. Draw structure of all the isotopes of **Hydrogen.** [3]

iv. What is **amphoteric oxide**? Give balanced reaction for an amphoteric oxide with HCl and NaOH. [3]

Question 7

i. State **type** of reaction: [2]
a) $NaNO_3 \longrightarrow NaNO_2 + O_2$
b) $Fe + HCl \longrightarrow FeCl_2 + H_2$
c) $N_2 + H_2 \longrightarrow NH_3$
d) $NH_3 + HCl \longrightarrow NH_4Cl$

ii. Define **Dobereiner's Triads** and explain it with an example. [2]

iii. Draw **orbit** structure of formation of **calcium oxide.** [3]

iv. State whether the substances printed in bold letters have been **oxidized** or **reduced.** [3]
a) $\mathbf{PbO} + CO \longrightarrow Pb + CO_2$
b) $\mathbf{Mg} + 2HCl \longrightarrow MgCl_2 + H_2$
c) $\mathbf{H_2S} + Cl_2 \longrightarrow 2HCl + S$
d) $\mathbf{Cl_2} + H_2S \longrightarrow 2HCl + S$

Question 8

i. Write **chemical formula** and **common name** of following salt**:** [2]
a) Sodium sulphate decahydrate
b) Copper (II) sulphate pentahydrate

ii. Define **redox reaction** with an example. [2]

iii. State merits of **Mendeleev Periodic table.** [3]

iv. An atom of barium may be written as $^{137}_{56}Ba$ [3]
a. What does the figure indicate written as **subscript?**
b. What does the figure indicate written as **superscript**?
c. What is the number of **protons** in atom of Barium?
d. What is the number of **electrons** in atom of Barium?
e. What is the number of **neutrons** in atom of Barium?
f. How many **electrons** are there in the **outermost shell** of Barium atom?

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