GREENLAWNS HIGH SCHOOL
SEMESTER I EXAMINATION
CHEMISTRY
IX – 23/09/24

Maximum Marks: 80

Time allowed: Two hours

Answers to this Paper must be written on the paper provided separately.

The time given at the head of this Paper is the time allowed for writing the answers.

Section A is compulsory. Attempt any four questions from Section B.

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

SECTION A
(Attempt all questions)

Question 1

Choose the correct answers to the questions from the given options.
(Do not copy the question, Write the correct answer only.) [15]

(i) Identify the element which is not a divalent.

(a) calcium (b) cobalt

(c) barium (d) aluminium

(ii) Eka-aluminium in Mendeleeff's periodic table is today known as

(a) Scandium (b) Aluminum

(c) Gallium (d) Germanium

(iii) Assertion (A): Elements arranged in increasing order of atomic number showed similarity in properties after regular intervals

Reason (R): Due to recurrence of similar electronic configuration after definite intervals of atomic number.

(a) Both A and R are true and R is a correct explanation for A

(b) Both A and R are true and R is not a correct explanation for A

(c) A is true but R is false

(d) A is false but R is true

(iv) No. of covalent bonds formed in a molecule A_2, when two atoms of element A with atomic number 8 undergo chemical combination.

(a) 3 (b) 2

(c) 1 (d) 0

(v) Cl_2 is most ___i___ while F_2 is most ____ii____ halogen.

(a) i-reactive, ii-abundant (b) i-abundant, ii-reactive

(c) i-reactive, ii-rare (d) i-rare, ii-non-reactive

(vi) The cation and anion together are bonded by

(a) covalent bond

(b) metallic bond

(c) electrovalent bond

(d) dative bond

(vii) Maximum number of electrons that can be accommodated in N-shell.

(a) 8 (b) 32

(c) 18 (d) 2

(viii) Isotope of hydrogen with atomic mass number 3 is known as

(a) protium (b) deuterium

(c) lantium (d) tritium

(ix) Hygroscopic substance which act as drying as well as dehydrating agent.

(a) H_2SO_4 (b) P_2O_5

(c) $CaCl_2$ (d) CaO

(x) On opening the soda bottle the CO_2 gas rapidly bubbles out as

(a) sudden ↑ in pressure cause ↑ in solubility

(b) sudden ↓ in pressure cause ↑ in solubility

(c) sudden ↑ in pressure cause ↓ in solubility

(d) sudden ↓ in pressure cause ↓ in solubility

(xi) $Na_2SO_4.10\ H_2O$ is

(a) hydrous below 36°C (b) anhydrous below 36°C

(c) anhydrous above 32°C (d) hydrous above 36°C

(xii) Pipe born water is

(a) bacteria free (b) minerals free

(c) chemical free (d) free from dissolved gases

(xiii) Decomposition of acetylene is carried out by the absorption of

(a) electrical energy (b) nuclear energy

(c) heat energy (d) sound energy

(xiv) Butane is a

(a) hydrocarbon (b) chlorocarbon

(c) alcohol (d) acid

(xv) Chemical symbol with charge as a superscript, represents a short form of

(a) compound (b) ion

(c) element (d) mixture

Question 2

(i) Identify the following : [5]

(a) Non metal which forms positive ion.

(b) Most reactive metal in an electro chemical series.

(c) Sodium salt of sulphonic acid.

(d) Term that refers to the distribution of electron in different shells.

(e) Ability of an element to exist in more than one form.

(ii) Complete the following by choosing the correct answers from the bracket: [5]

(a) _____ have two valence electrons in outer shell. (Helium / Neon)

(b) Atomic weight of Na is average mean of potassium and _____. (Lithium / Caesium)

(c) Total number of protons and neutrons is called _____. (nucleus / nucleons)

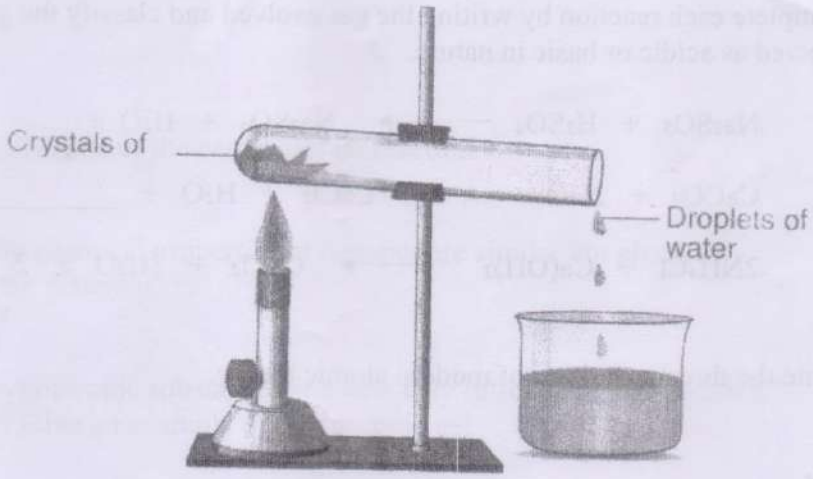
(d) Soft water free from all solutes is _____ water. (distilled / natural).

(e) Thermal _____ are reversible reactions . (decomposition / dissociation)

(iii) Match the following [5]

(a)	Exothermic	1.	Yellow
(b)	O_2	2.	$+\Delta T$
(c)	Endothermic	3.	double bond
(d)	litharge	4.	Single bond
(e)	Cl_2	5.	$-\Delta T$

(iv) Answer the question based on the heating of hydrated salt. [5]



(a) Blue coloured hydrated metal sulphate salt is used in the above experiment, identify the salt used.

(b) Number of water molecules present in the crystal of a above salt.

(c) Nature of the solid obtained after heating the salt crystals.

(d) Hydrated salt used in the above experiment is _____ substance. [efflorescent / deliquescent]

(e) When does efflorescence occur?

(v) (a) Write the chemical formula of the following compounds : [5]

(i) Cuprous nitrate (ii) Mercuric sulphide (iii) Ferrous sulphite

(iv) Zinc bicarbonate (v) Potassium permanganate

SECTION B

(Attempt any four questions)

Question 3

(i) What is chemical equation? What does it show? [2]

(ii) Write the characteristic properties of true solutions with respect to nature and particle size. [2]

(iii) Complete each reaction by writing the gas evolved and classify the gases evolved as acidic or basic in nature. [3]

(a) $Na_2SO_3 + H_2SO_4 \longrightarrow Na_2SO_4 + H_2O +$ _____

(b) $CaCO_3 + 2HCl \longrightarrow CaCl_2 + H_2O +$ _____

(c) $2NH_4Cl + Ca(OH)_2 \longrightarrow CaCl_2 + 2H_2O + 2$ _____

(iv) Write the three postulates of modern atomic theory. [3]

Question 4

(i) Identify the oxides which are unstable to heat :- [2]

(a) K_2O (b) CuO (c) HgO

(d) CaO (e) AgO

(ii) Draw the atomic orbital structure of HCl. [2]

(iii) Mention and explain 3 applications of solubility curves. [3]

(iv) Discuss the separation of elements (placements of elements) in the long form of periodic table as metals, non-metals and noble gases. [3]

Question 5

(i) Calculate the molecular weight of H_3PO_4. [H = 1, P = 31, O = 16] [2]

(ii) Common salt turns moist on exposure to air. [2]

(iii) Draw an atomic orbital structure of CaO molecule. (Ca = 20 & O = 8) [3]

(iv) Define precipitation reaction. Complete and rewrite the given balanced chemical equation and classify the salts produced as a soluble or insoluble salts [3]

(a) $Zn(NO_3)_2 + Na_2CO_3 \longrightarrow 2$ _____ + _____

Question 6

(i) Give 2 applications of the neutralisation reaction. [2]

(ii) Explain why chemical properties of isotopes are similar but physical properties are different. [2]

(iii) What are hygroscopic substances and how they differ from deliquescent substances? Give an example of hygroscopic gel. [3]

(iv) Draw the atomic orbital structure of N_2 molecule. [3]

Question 7

(i) State octet rule. How H and O attain chemical activity in H_2O molecule? [2]

(ii) Balance and rewrite the following chemical equations : [2]

(a) $Fe_2O_3 + CO \longrightarrow Fe + CO_2$

(b) $Ca(OH)_2 + HNO_3 \longrightarrow Ca(NO_3)_2 + H_2O$

(iii) Write the colour and solubility of ppt. formed by following ions in **zxdf[3]**

excess of NaOH. (a) Fe^{2+} (b) Zn^{2+} (c) Pb^{2+}

(iv) Explain 3 defects in Mendeleeff's periodic table. [3]

Question 8

(i) Discuss 2 drawbacks of Newland's law of octave. [2]

(ii) (a) Water containing $CaCO_3$ (b) Water containing $Ca(HCO_3)_2$ [2]

Which of the above water can be rendered soft by mere boiling?

Write balance equation representing this conversion.

(iii) Draw atomic orbital structure of CCl_4. [3]

(iv) Calculate the relative molecular mass of CH_3COOH and find the percentage composition of O in the molecule. [c = 12, O = 16, H=1] [3]