GREENLAWNS HIGH SCHOOL
SEMESTER II EXAMINATION
CHEMISTRY
IX – 25/02/25

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) Metal which can replace hydrogen in dilute acid.

(a) calcium (b) copper

(c) mercury (d) silver

(ii) 273K is _____˚C

(a) 100 (b) – 100

(c) 0 (d) 273

(iii) Assertion (A): CO and CO_2 combine are responsible for melting of polar ice caps.

Reason (R): As CO and CO_2 are global warming gases.

(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) Beryllium has two electrons in the valence shell and two shells. It belongs to

(a) group IIA & period 1 (b) group 2 & period 3

(c) group IA & period 2 (d) group 2 & period 2

(v) Electrons have

(a) zero mass and 0 charge (b) zero mass and +1 charge

(c) negligible mass and – 1 charge (d) negligible mass and 1 charge

(vi) Wavelengths of ultraviolet radiation is

(a) exactly same as that of visible light

(b) less than that of visible light

(c) more than that of visible light

(d) almost same as that of visible light

(vii) Standard pressure is equal to

(a) 76 cm of Ag (b) 76 mm of Ag

(c) 7.60 mm of Hg (d) 76 cm of Hg

(viii) _____ act as a oxidising agent is solid state.

(a) HClO (b) MnO_2

(c) Br_2 (d) H_2O_2

(ix) Univalent element which forms covalent compounds with non-metals.

(a) Cl (b) Na

(c) Mg (d) O

(x) While forming $MgCl_2$ molecule each atom of Mg losses ___i___ electrons and each atom of Cl gains ____ii____ electrons respectively.

(a) i. 1 , ii. 1 (b) i. 1 , ii. 2

(c) i. 2 , ii. 1 (d) i. 2 , ii. 2

(xi) Number of electrons shared during formation of N_2 molecule are

(a) 6 (b) 4

(c) 2 (d) 3

(xii) Group 3 to 12 contains

(a) reactive metals (b) transition metals

(c) post transition metals (d) metalloids

(xiii) Triad of elements which reacts explosively with dil. HCl.

(a) K, Na & Ca (b) Al, Na & Ca

(c) Mg, Na & Ca (d) K, Fe & Ca

(xiv) Temperature of gas G is kept constant and pressure is increased from 1 atmos. to 4 atmos., volume at 1 atmos. was 500 ml, find volume of the gas at 4 atmos.

(a) 100 ml (b) 250 ml

(c) 120 ml (d) 125 ml

(xv) pH of acid rain is

(a) more than 5.6 (b) equal to 5.6

(c) more than 6.5 (d) less than 5.6

Question 2

(i) Identify the following : **[5]**

(a) The force which holds atoms present in a stable molecule.

(b) Atoms of the same element with different physical but similar chemical properties.

(c) Element which melt, forms globule and dart in the water.

(d) Gas which is a major component of L.N.G.

(e) The temperature of –273˚C.

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

(a) _____ acid present in natural/normal rain water. (H_2CO_3 / H_2PO_4)

(b) Gases kept in contact diffuse to form _____ mixture. (heterogenous / homogenous)

(c) Hydrogen is _____ to litmus. (acidic / neutral)

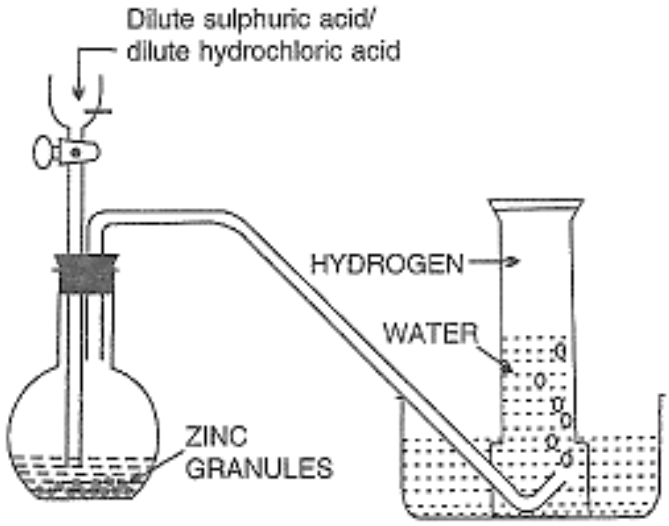
(d) Non-metallic character _____ down the group. (increases / decreases).

(e) _____ arranged elements in increasing order of atomic number (Mendeleeff / Moseley)

(iii) Match the following **[5]**

(a)	1mm Hg	1.	Dobson
(b)	H_2	2.	prevents tooth decay
(c)	F_2	3.	molecule with double bond in it
(d)	O_2	4.	difficult to liquefy
(e)	O_3	5.	torricellie

(iv) Answer the question based on the laboratory preparation of Hydrogen **[5]**



(a) Write the chemical reaction for the above preparation.

(b) Write an advantage of using granulated zinc.

(c) Name the chemical which is used to increase the rate of reaction.

(d) How is hydrogen collected?

(e) Name the apparatus used to add dilute HCl.

(v) Write the reason/condition for use of hydrogen as : **[5]**

(i) A fuel gas in the form of coal gas (ii) In meteorological balloons

(iii) Hydrogenation of coal (iv) In welding & cutting of metals

(v) While extracting metals from their oxide ores.

SECTION B

(Attempt any four questions)

Question 3

(i) Draw the atomic orbital diagram of nitogen molecule. [N = 7] **[2]**

(ii) Draw atomic orbital diagram of water molecule **[2]**

(iii) Give three characteristics of elements classified as normal elements in the periodic table. **[3]**

(iv) Give three tests which are positive for oxidizing agents . **[3]**

Question 4

(i) A weather balloon has a volume of 175*l* when filled with hydrogen gas at a pressure of 1.0 bar. Calculate the volume of the balloon when it rises to a height where the atmospheric pressure is 0.35 bar. Assume that the temperature remains constant. **[2]**

(ii) How catalytic converter helps reduce pollution**?** **[2]**

(iii) Write the balanced chemical equations in the preparation of hydrogen from brine, natural gas and calcium hydride. . **[3]**

(iv) What are transition and inner transition elements? Discuss their placement in modern periodic table **[3]**

Question 5

(i) $Zn + CuSO_4 \longrightarrow ZnSO_4 + Cu$ **[2]**
Prove that above reaction is a redox reaction

(ii) Volume of a gas at 350 mm pressure is 60cc Find the pressure in cm, when volume is 28cc at constant temperature. **[2]**

(iii) Draw an atomic orbital structure of NH_3 molecule. (N^{14}_7 & H_1^1) and define the type of bond formed between the atoms of ammonia molecules **[3]**

(iv) Discuss the formation of ozone in the stratosphere. **[3]**
Write the chemical equation involved.

Question 6

(i) Draw atomic orbital diagram of hydrogen chloride molecule. [H = 1 , Cl = 17] **[2]**

(ii) Write the definition of (a) ionization potential and (b) electron affinity **[2]**

(iii) A sample of helium has a volume of 500 ml at 75˚C. calculate the temperature at which the volume becomes 260 ml when pressure is kept constant. **[3]**

(iv) What are ozone holes? Give the 2 ways to decrease the size of ozone holes **[3]**

Question 7

(i) Give two reasons for the chemical activity of an atom. **[2]**

(ii) Write the following chemical equations **:** **[2]**

(a) Conversion of H_2S released during bacterial decay of organic matter to SO_2.

(b) Rosting of zinc sulphide in excess of air to release sulphur dioxide.

(iii) A certain mass of a gas has volume 76.0 cm^3 at 27˚C and at 700 mm of Hg. What will be its volume at S.T.P.? **[3]**

(iv) Explain 3 contributions of Mendeleeff to the periodic table. **[3]**

Question 8

(i) Write the Dobereiner's law of triads. **[2]**

(ii) Draw the atomic orbital diagram of oxygen molecule [O = 8] **[2]**

(iii) Why is C.N.G considered as a viable alternative to petrol and diesel? **[3]**

(iv) On heating a certain gas its volume increases by 50% and pressure decreases to 60% of its original value. If the original temperature was – 15˚C, find the temperature to which it was heated. **[3]**