

**GREENLAWNS HIGH SCHOOL**  
**SEMESTER I EXAMINATION**  
**CHEMISTRY**  
**IX – 29/9/23**

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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.

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

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

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**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) A solution may be formed by mixing
- (a) liquid with gas                      (b) solid with liquid
- (c) liquid with liquid                      (d) all of the above
- (ii) Which amongst the following is not considered as a halogen?
- (a) F                      (b) Ba
- (c) Br                      (d) Cl
- (iii) Factor responsible for similar chemical properties of  $^{14}_6\text{C}$  &  $^{12}_6\text{C}$ .
- (a) same number of protons                      (b) same mass number
- (c) same number of valence electrons                      (d) same number of neutrons

- (iv) Identify an element among the following .
- (a)  $\text{H}_2\text{S}$                       (b)  $\text{H}_2\text{SO}_4$   
(c)  $\text{H}_2\text{O}$                         (d)  $\text{H}_2$
- (v) Name the positive radicals present in the compound  $\text{FeSO}_4$
- (a) Ferric                      (b) Ferrous  
(c) Ferrum                      (d) Ferrom
- (vi) In modern periodic table number of orbits across the period.
- (a) increases from left to right                      (b) increases from right to left  
(c) decreases from left to right                      (d) remain same
- (vii) On adding Lithium to water, the solution formed is
- (a) alkaline                      (b) neutral  
(c) acidic                        (d) amphoteric
- (viii) Identify the crystal which is not deliquescent.
- (a)  $\text{CaCl}_2$                       (b)  $\text{NaOH}$   
(c)  $\text{Na}_2\text{SO}_4$                       (d)  $\text{KOH}$
- (ix) Which shell is occupied by electron with minimum energy.
- (a) L                              (b) K  
(c) M                              (d) N
- (x) Number of shared pair of electrons in nitrogen molecule.
- (a) 2                              (b) 1  
(c) 3                              (d) 0

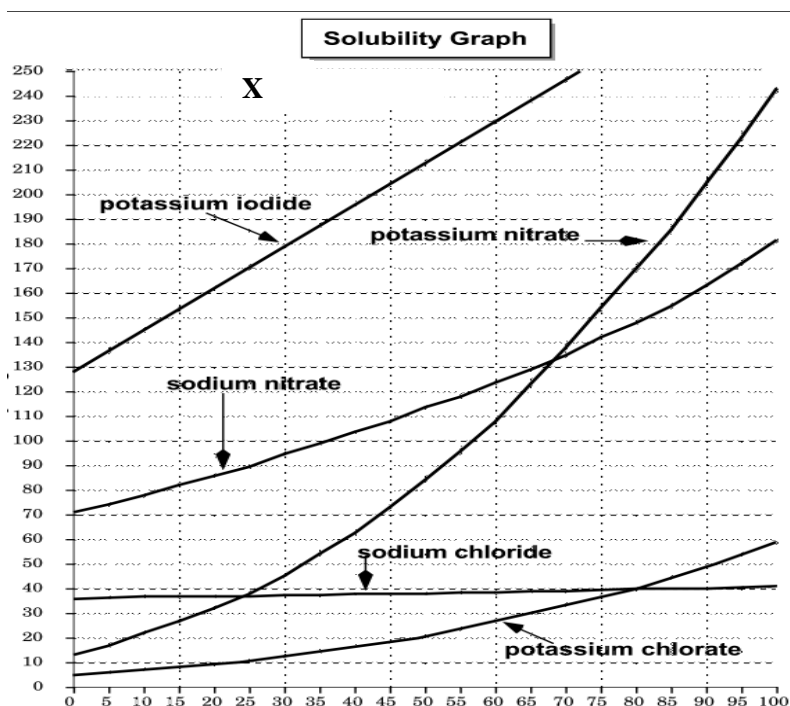
- (xi) On application of heat ammonium chloride undergoes
- (a) thermal decomposition                      (b) thermal dissociation  
(c) thermal dehydration                      (d) thermal fusion
- (xii) Compound acetylene gives hydrogen gas and solid carbon, when \_\_\_ energy is supplied to it.
- (a) heat                      (b) light  
(c) sound                      (d) electrical
- (xiii) Solvent which can be used to separate mixture of sulphur and iodine.
- (a) benzene                      (b) carbon disulphide  
(c) acetone                      (d) oxalic acid
- (xiv) Substance which act as both dehydrating and drying agent.
- (a) Conc. Sulphuric acid                      (b) quicklime  
(c) fused calcium chloride                      (d) fused phosphorous pentaoxide
- (xv) Formula of dinitrogen oxide is
- (a)  $N_2O_2$                       (b)  $NO_2$   
(c)  $N_2O$                       (d)  $NO$

## Question 2

- (i) Select the correct answer from the brackets to complete the following statements. [5]
- (a) High temperature causes \_\_\_\_\_ in solubility of gases in water. [increase / decrease]
- (b) Alkali metals and halogens both are \_\_\_\_\_. [univalent / covalent]
- (c) \_\_\_\_\_series mostly contain radioactive elements. [Lanthanide / Actinide]
- (d) Element that exhibit tetra valency is \_\_\_\_\_. [gold / lead]

(e) In  $\text{CH}_4$  molecule carbon atom attain stability as per \_\_\_\_\_ configuration.  
[octet / duplet]

(ii) Analyse the solubility graph/curve and answer the questions based on the graph. [5]

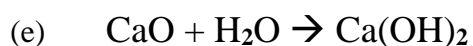
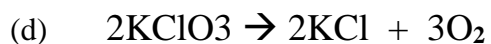
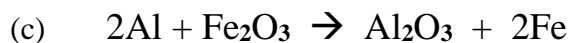
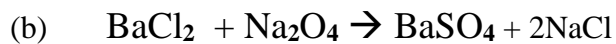
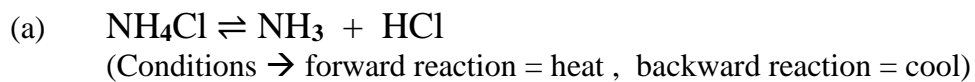


- (a) Define solubility curve.
- (b) Label the x-axis and y-axis of the solubility graph.
- (c) Name the salt which shows minimum variation in solubility from the graph.
- (d) Compare the solubility of two sodium salts shown in the graph?
- (e) Write the effect of change in pressure on solubility of solid.

(iii) Match the following [5]

- |  |                     |
|--|---------------------|
| (a) Calcium sulphate                           | 1. Single lone pair |
| (b) Copper sulphate                            | 2. Exothermic       |
| (c) Combination of $\text{N}_2$ & $\text{H}_2$ | 3. two lone pairs   |
| (d) Ammonia molecule                           | 4. Blue vitriol     |
| (e) Water molecule                             | 5. Gypsum           |

(iv) Classify each of the following reactions as combination, decomposition, displacement, double decomposition and thermal dissociation [5]



(v) Draw the atomic orbital structure for each of the following compounds. [ H =1 , C = 6 , Na = 11 and Cl = 17 ] [5]

(a) Methane.

(c) Sodium chloride.

## SECTION B

### Question 3

- (i) Complete the following table : [5]

Sr.no.	Compound	Type	Elements present	Formula
1		Acid		CH <sub>3</sub> COOH
2	Zinc hydroxide		Zinc, Oxygen, Hydrogen	
3	Potassium bromide	Salt		
4			Carbon, Hydrogen	C <sub>2</sub> H <sub>6</sub>
5	Propanol			C <sub>3</sub> H <sub>7</sub> OH

- (ii) Write the balanced chemical equations as per given information : [3]

- (a) Photochemical decomposition of AgCl gives Ag and Cl<sub>2</sub>
- (b) Thermal decomposition of Pb<sub>3</sub>O<sub>4</sub> gives PbO and O<sub>2</sub>
- (c) O<sub>2</sub> in presence of ultra violet light forms O<sub>3</sub> which keeps getting converted back to O<sub>2</sub>.

- (iii) Give reason : [2]

- (a) True solution is a mixture and not a compound.
- (b) Water supplied for domestic use / pipe borne water is not considered purest.

### Question 4

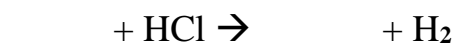
- (i) Name the noble gas which attend stability as a result of duplet configuration. Why the atom of noble gases are extremely unreactive? [3]
- (ii) Define electrovalent and covalent bond. Classify the following compounds into electrovalent or covalent compounds : [3]
- CaO CO SiO<sub>2</sub> Na<sub>2</sub>S
- (iii) Give two reasons for the periodicity in properties of elements in modern periodic table [2]
- (iv) What are bridge elements? Give two examples [2]

### Question 5

- (i) Define chemical reaction and list the four characteristics accompanying a chemical reaction. [3]
- (ii) Arrange the given elements in decreasing order of reactivity. [3]

K, H, Mg, Ag, Al

Select a group 2 metal from the list and complete the equation with balancing.



- (iii) Distinguish between [4]
- (a) Hydrated substance and Anhydrous substance [definition]
- (b) Dilute solution and concentrated solution [definition]
- (c) Atomic number and Mass number [definition]
- (d) Mendeleeff's periodic law and Modern periodic law [definition]

### Question 6

- (i) Identify the cation in a salt by analysing the colour of the precipitate : [3]
- (a) When sodium hydroxide solution is added to a solution of compound A, a chalky white precipitate is formed.
- (b) When sodium hydroxide solution is added to a solution of compound B, a gelatinous precipitate is formed.
- (c) When sodium hydroxide solution is added to a solution of compound C, a pale blue precipitate is formed.
- (ii) Define crystallisation. State conditions for crystallisation and one precaution. [3]
- (iii) Calculate the relative molecular mass of  $\text{Mg}_3(\text{PO}_3)_2$  [ Mg = 24, P = 31, O = 16 ] [2]
- (iv) Rewrite the balanced chemical reactions : [2]
- (a)  $\text{H}_2\text{S} + \text{Cl}_2 \rightarrow \text{S} + \text{HCl}$
- (b)  $\text{Al} + \text{H}_2\text{O} \rightarrow \text{Al}_2(\text{OH})_3 + \text{H}_2$

### Question 7

- (i) Explain the following give appropriate example where applicable : [4]
- (a) Allotropy
- (b) Electronegativity
- (ii) Calculate the percentage composition of N in  $\text{Na}_3\text{N}$ . [ Na = 23, N = 14 ] [3]
- (iii) Why common salt which is not deliquescent behave as deliquescent during humid conditions? [1]
- (iv) What are radicals? Give one monovalent positive and one monovalent negative radical. [2]

### Question 8

- (i) The valency of metal X is 3 positive. Give the formula of its [3]
- (a) hydroxide (b) oxide (c) phosphate
- (ii) Calculate the total percentage of magnesium in hydrated magnesium nitrate crystals,  $\text{Mg}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$  [ Mg = 24, N = 14, O = 16, H = 1 ] [3]
- [At.wt. of  $\text{H}_2\text{O}$  = 18]
- (iii) Define : (a) Electron affinity (b) Ionisation potential [2]
- (iv) Classify the following as information provided by the chemical equations or as limitations of chemical equations [2]
- (a) direction of the reaction (c) state of matter of reactant & product
- (b) speed of the reaction (d) changes in colour during reaction