

GREENLAWNS SCHOOL, WORLI  
FINAL EXAMINATION: 2023-24  
CHEMISTRY

Std: IX  
Date: 13/02/2024

Marks: 80  
Time: 2 hrs

You will **not** be allowed to write during the first **10** minutes. This time is to be spent in reading the Question paper. 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**.

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**SECTION A**

*(Attempt **all** questions from this section)*

**Question 1**

Choose one correct answer to the questions from the given options:

[15]

- (i) The product formed in the following reaction is:  
$$\text{NaCl}_{(aq)} + \text{AgNO}_{3(aq)} \longrightarrow \text{_____} + \text{NaNO}_{3(aq)}$$
- (a)  $\text{ClNO}_3$
  - (b) AgNa
  - (c) AgCl
  - (d) None of these
- (ii) A saturated solution can be converted to unsaturated solution by adding more:
- (a) Solute
  - (b) Salt
  - (c) Solvent
  - (d) Minerals
- (iii) Which of the following is correct with respect to metals?
- (a) Can gain electrons to form cations
  - (b) Can lose electrons to form anions
  - (c) Can lose electrons to form cations
  - (d) Can gain electrons to form anions
- (iv) Which element of group 17 is solid in nature?
- (a) Chlorine
  - (b) Fluorine
  - (c) Bromine
  - (d) Iodine
- (v) Vegetable oils (palm oil) turn to semisolid fats by:
- (a) Oxidation
  - (b) Hydrogenation
  - (c) Dehydrogenation
  - (d) All of these

- (vi) The absolute temperature value that corresponds to  $28^{\circ}\text{C}$  is:
- (a) 301 K
  - (b) 287 K
  - (c) 28 K
  - (d) 273 K
- (vii) The gas with rotten egg odour:
- (a) Hydrogen sulphide
  - (b) Sulphur dioxide
  - (c) Ammonia
  - (d) Hydrogen chloride
- (viii)  $\text{MOH}$  is the formula of the hydroxide of a metal  $\text{M}$ . The formula of its sulphate should be:
- (a)  $\text{MSO}_4$
  - (b)  $\text{M}(\text{SO}_4)_2$
  - (c)  $\text{M}_2\text{SO}_4$
  - (d)  $\text{M}_2(\text{SO}_4)_3$
- (ix) The colour of one of the gas when lead nitrate decomposes is:
- (a) Green
  - (b) Reddish brown
  - (c) Blue
  - (d) Yellow
- (x) The number of water of crystallisation in Epsom salt is:
- (a) 5
  - (b) 7
  - (c) 10
  - (d) 3
- (xi) Nucleons are found in the:
- (a) Central part of nucleus
  - (b) Extra-nuclear space
  - (c) Everywhere in an atom
  - (d) None of these
- (xii)  $\text{CO}_2$  and  $\text{SO}_2$  can be distinguished by:
- (a) Lime water
  - (b) Reaction with lime
  - (c) Acidified  $\text{K}_2\text{Cr}_2\text{O}_7$  solution
  - (d) Lead nitrate solution
- (xiii) When steam is passed over red-hot iron:
- (a) Magnetic oxide of iron is formed and hydrogen is obtained

- (b) Reversible reaction occurs
- (c) None of the above
- (d) Both (a) and (b)

(xiv) The physical state of Copper carbonate is:

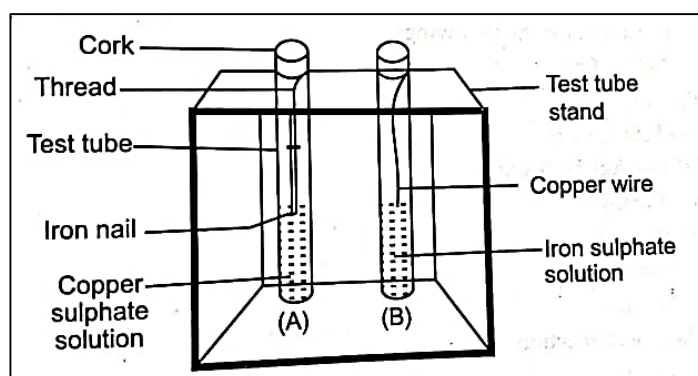
- (a) Orange solid
- (b) Green solid
- (c) White solid
- (d) Blue crystals

(xv) Which of the following statements is incorrect about the elements – Na, Mg, Al, Si:

- (a) Each element belongs to the same period
- (b) Each element have the same valency
- (c) They are written in the order of their non-metallic character increasing
- (d) Number of shells are same

### Question 2

(i) Observe the two test tubes A and B in the diagram given below and answer the following questions: [4]



- (a) In which test tube, will the reaction take place?
- (b) Justify your above answer.
- (c) Name the type of reaction.
- (d) Give balanced equation for the reaction which takes place.

(ii) Match the following: [6]

#### Column A

- (a) Ammonia
- (b) 1 atm
- (c) Liquid metal
- (d) Ferrous hydroxide
- (e) Quick lime
- (f) Duplet

#### Column B

1. Mercury
2. Dirty green
3. Hygroscopic
4. Basic
5. Helium
6. 760 mm Hg

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

- (a) Covalency of nitrogen is \_\_\_\_\_ (two / three).

- (b) Lanthanides and actinides are called as \_\_\_\_\_ (transition / inner-transition).
- (c) \_\_\_\_\_ does not displace hydrogen from dilute acid (Gold / sodium).
- (d) The substance which decomposes violently with flashes of light leaving a voluminous green residue is \_\_\_\_\_ (Ammonium chloride / Ammonium dichromate).
- (e) The boiling point of water \_\_\_\_\_ due to the presence of dissolved impurities in it. (increases / decreases).

(iv) What do you observe when: [5]

- (a) Ammonia gas is passed through Nessler's reagent.
- (b) Sodium hydroxide solution is mixed with Copper sulphate solution.
- (c) Zinc carbonate is heated in a dry test tube.
- (d) Aluminium is reacted with hot and concentrated KOH.
- (e) Ferric chloride is exposed to atmosphere.

(v) Give balanced equations for the following: [5]

- (a) Action of heat on zinc nitrate.
- (b) Lead reacts with Sodium hydroxide.
- (c) Removal of permanent hardness in water.
- (d) An example of a reaction that uses a catalyst.
- (e) Passage of Hydrogen chloride gas through silver nitrate solution.

## SECTION B

(Attempt **any four** questions.)

### Question 3

(i) Under what conditions can hydrogen be made to combine with: [4]

- (a) Nitrogen
- (b) Chlorine
- (c) Sulphur
- (d) Oxygen

Name the products in each case and write the equation for each reaction.

(ii) An element 'M' has three electrons more than the noble gas. Give the formula of its: [3]

(Note: Do not identify the real M)

- (a) Phosphate
- (b) Oxide
- (c) Sulphite
- (d) Chloride
- (e) Hydroxide
- (f) Nitrate

(iii) Mention three defects of Mendeleeff's Periodic Table and how were they resolved by Moseley. [3]

### Question 4

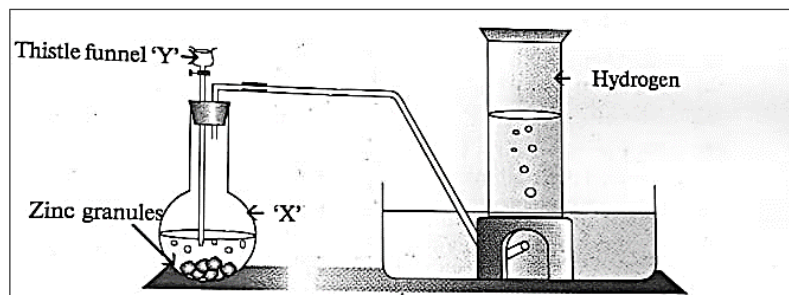
(i) With the help of an atomic orbit structure diagram, explain the formation of: [6]

- (a) Ammonia
- (b) Carbon tetrachloride
- (c) Water

- (ii) Name two elements whose properties were correctly predicted by Mendeleev. [2]  
Mention their present day name.
- (iii) Why is it necessary to compare gases at STP? What are the STP conditions? [2]

### Question 5

- (i) The apparatus below is set to obtain hydrogen gas in the laboratory:



- (a) Give an equation for the preparation of the gas. [1]
- (b) Which impurity produced above, can be removed by passage through lead nitrate solution, in the preparation of hydrogen. [1]
- (c) How is hydrogen gas collected in the above reaction? [1]
- (d) Justify your above answer by giving two reasons. [2]
- (e) Name the acid not used in the preparation of hydrogen from metals and why? [2]
- (ii) At 0°C and 760 mm Hg pressure, a gas occupies a volume of 100 cm<sup>3</sup>. The Kelvin temperature of the gas is increased by one-fifth, while the pressure is increased one and half-times. Calculate the final volume of the gas. [3]

### Question 6

- (i) Write your observations when dilute sulphuric acid is added to the following: [3]
- A metal (zinc)
  - A metal carbonate (sodium carbonate)
  - A metal sulphide (sodium sulphide)
- (ii) An important step in the manufacture of hydrogen takes place when a mixture of hydrogen and carbon monoxide with steam is passed over iron [III] oxide at 450°C. [2]
- $$(\text{CO} + \text{H}_2) + \text{H}_2\text{O} \longrightarrow \text{CO}_2 + 2\text{H}_2 + \Delta$$
- State, briefly, how a suitable mixture of hydrogen and carbon monoxide can be obtained. Give the equation.
  - How can hydrogen be separated from carbon dioxide and unreacted carbon monoxide?
- (iii) State the effect of temperature on solubility of the following: [2]
- Calcium sulphate
  - Potassium nitrate
- (iv) State the observation when potassium reacts with cold water. [2]  
Give a balanced equation for the same.

(v) Arrange the elements of the 2<sup>nd</sup> period in the decreasing order of valence electrons. [1]

### Question 7

(i) Elements A, B, C and D have atomic numbers 9, 20, 10 and 17 respectively.

- (a) Which of these elements are metals and non-metals? [1]  
(b) Give the electronic configuration of the element C. [½]  
(c) Identify the element which exists in the isotopic form. [½]  
(d) What will be the formula of the compound between A and B? [1]  
(e) Define isotopes. [1]

(ii) Write equations for the conversion A to C using suitable reactants if any: [3]



(iii) Calculate the percentage of nitrogen in urea  $\text{CO}(\text{NH}_2)_2$  (At mass: N=14, C=12, H=1) [2]

(iv) Give one chemical test to determine that the gas filled in a jar is  $\text{H}_2\text{S}$ . [1]

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