

# GUIDELINES

(By Subrata Sir, Sunny Sir & group of ICSE and CBSE school teachers)

## CHEMISTRY, CLASS – X MOCK PAPER – 1 (2024)

Time: 2 hours

Total Marks: 80

### General Instructions:

1. Answers to this Paper must be written on the paper provided separately.
2. You will not be allowed to write during the first 15 minutes. This time is to be spent in reading the question paper.
3. The time given at the head of this Paper is the time allowed for writing the answers.
4. Attempt all questions from Section A, any 4 questions from section B.
5. The intended marks for questions or parts of questions are given in bracket [ ].

### SECTION A

#### Question 1

Choose the correct answers from the options given below:

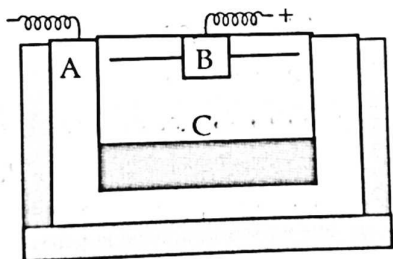
(15)

- i) This is non metal liquid at room temperature  
a) Fluorine b) Bromine c) Chlorine d) Iodine
- ii) When a metal atom becomes an ion:  
a) It loses electrons and is oxidised b) It gains electrons and is reduced c) It gains electrons and is oxidised d) It loses electrons and is reduced
- iii) During the electrolysis of concentrated hydrochloric acid, the product obtained  
a) ) Oxygen b) Hydrogen c) Chlorine d) None of these.
- iv) In the given equation, identify the role played by concentrated sulphuric acid:  
 $S + H_2SO_4 \rightarrow 3SO_2 + 2H_2O$   
a) Non-volatile b) oxidizing agent c) Dehydrating agent d) None of these
- v) Identify the statement that is incorrect about alkanes:  
a) They have general formula of  $C_nH_{2n+2}$  b) These are saturated hydrocarbons. c) There is a single covalent bond between carbon and hydrogen.  
d) They can undergo both substitution as well as addition reactions.
- vi) The unsaturated hydrocarbons undergo:  
a) A substitution reaction b) An oxidation reaction c) An addition reaction d) None of these
- vii) IUPAC name of formic acid is:  
a) Methanoic acid b) Ethanoic acid c) Propanoic acid d) Butanoic acid

- viii)  $\text{H}_3\text{PO}_3$  is  
 a) Monobasic acid b) Dibasic acid c) tribasic acid d) triacidic base
- ix) Hydrogen chloride can be obtained by adding concentrated sulphuric acid to:  
 a)  $\text{NaCl}$  b)  $\text{Na}_2\text{CO}_3$  c)  $\text{Na}_2\text{SO}_4$  d)  $\text{NaNO}_3$
- x) The functional group present in acetic acid is:  
 a) Ketone ( $\text{C} = \text{O}$ ) b) Hydroxyl ( $-\text{OH}$ ) c) Carboxyl ( $-\text{COOH}$ ) d) Aldehyde ( $-\text{CHO}$ )
- xi) The hydroxide soluble in excess of ammonium hydroxide is:  
 a) Zinc hydroxide b) Lead hydroxide c) Magnesium hydroxide d) Ferrous hydroxide
- xii)  $\text{CH}_3\text{COONa}$  is  
 a) Strong electrolyte b) Weak electrolyte c) strong acid d) none of these
- xiii) A hydrocarbon which does not contain any functional group :  
 a) Methane b) Ethene c) Ethyne d) Propyne
- xiv) The reason for using aluminium in the alloy duralumin is:  
 a) Aluminium is brittle. b) Aluminium brings lightness. c) Aluminium gives strength. d) Aluminium lowers melting point.
- xv) Concentrated sulphuric acid is:  
 a) Monobasic acid b) Dibasic acid c) Tribasic acid d) Monoacidic base

## Question 2

- i) Following is the sketch of electrolytic cell used in the extraction of aluminium: 5



- What is the substance of which the electrodes A and B are made?
- At which electrode (A or B) is the aluminium deposited?
- What are the two aluminium compounds in the electrolyte C?
- Why is it necessary for electrode B to be continuously replaced?
- Name the ore used in extraction of aluminium.

ii) Match the column I with column II: (5)

	Column I		Column II
(a)	Hydrogen chloride	A	Increases
(b)	Ammonium ion	B	Covalent bond
(c)	Metallic character across a period	C	Polar covalent compound
(d)	Non-metallic character down the group	D	Covalent and co-ordinate bond
(e)	Water	E	Decreases

iii) From the list given below, select the word(s) required to correctly complete blanks (i) to (v) in the following passage. The words from the list are to be used only once. [hydrogen, hydronium, salt, water, precipitate, hydroxide, ammonia, ammonium, carbonate, carbon dioxide] 5

- A solution M turns blue litmus red, so it must contain (i)..... ions; another solution O turns red litmus blue and hence, must contain (ii).....ions
- When solutions M and O are mixed together, the products will be (iii)..... and (iv).....
- If a piece of magnesium was put into a solution M, (v).....gas would be evolved

iv) A. Name the following: (5)

- Second member of alkene series
- First member of alkane series

B Complete and balance the following chemical reactions:

- $\text{MnO}_2 + \text{HCl} \rightarrow \rightarrow$
- $\text{Zn} + \text{HCl} \rightarrow$
- $\text{FeCl}_3 + \text{NH}_4\text{OH} \rightarrow$

v) Draw the structural formula for the following

a)

- 2-butene
- Propanoic acid
- 2,2 dimethyl butane

b) A compound has the following percentage composition by mass:

Carbon 14.4%, hydrogen 1.2% and chlorine 84.5%. Determine the empirical formula

Of this compound. (H=1, C=12, Cl=35.5) (3+2)

## Section-B

(Attempt any four questions from this Section.)

### Question 3

(i) Calculate the percentage of nitrogen in aluminium nitride. (Al = 27, N = 14) (2)

(ii) The Compound A has the following percentage composition by mass: carbon 26.7%, oxygen 71.1%, hydrogen 2.2%. Determine the empirical formula of A.

(H=1, C=12, O= 16). If the relative molecular mass of A is 90, what is the molecular formula of

A?

(iii) Explain the following

- a) Dilute nitric acid is generally considered a typical acid but not so in its reaction with metals.
- b) Concentrated nitric acid appears yellow when it is left standing in a glass bottle.

(iv) Choose the most appropriate answer from the following list of oxides which fit the description. Each answer may be used only once

(SO<sub>2</sub>, SiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub>, MgO, CO, Na<sub>2</sub>O)

- (a) A basic oxide.
- (b) An oxide which dissolves
- (c) An amphoteric oxide.

#### Question 4)

i) The following questions are pertaining to the laboratory preparation of Hydrogen chloride gas. (3)

- (a) Write a balanced chemical equation for its preparation mentioning the condition required.
- (b) Why is concentrated Nitric Acid not used in the preparation of Hydrogen Chloride gas?
- (c) How is Hydrogen Chloride gas collected?

ii) Give an equation for the reaction of conc.HNO<sub>3</sub> with

- a) Carbon
- b) Copper

iii) Draw the electron dot structure for the following (3)

- a) H<sub>3</sub>O<sup>+</sup>
- b) CO<sub>2</sub>

iv) Explain Gay Lussac's law of combining volume. (1)

#### Question 5

i) State any one observation for each of the following: (2)

- (a) Dilute hydrochloric acid is added to silver nitrate solution.
- (b) Concentrated nitric acid is added to copper turnings.

(ii) Write a balanced equations for the following: (2)

- (a) C<sub>2</sub>H<sub>5</sub>Br + aq KOH →
- (b) CH<sub>3</sub>COONa + soda lime →

iii) State one observation for: Excess NH<sub>4</sub>OH solution is added to ZnSO<sub>4</sub> solution (2)

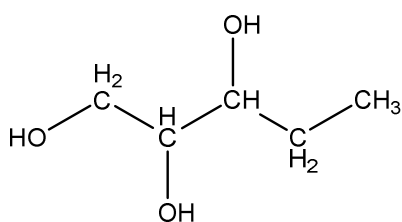
iv) State how the following conversions can be carried out: (4)

- a) Ethyl chloride to ethene
- b) Ethyne from calcium carbide.
- c) Ethyl bromide to ethane
- d) Methane to ethane

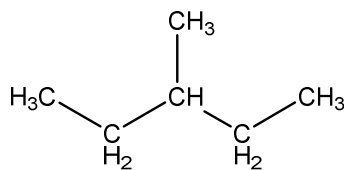
### Question 6

i) Give the correct IUPAC names for each of the compounds whose structural formulae are given: (4)

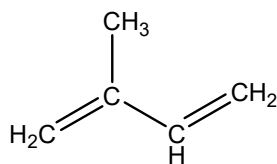
a)



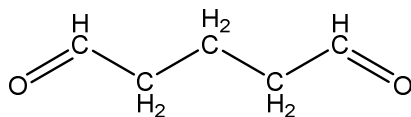
b)



c)



d)



ii) Give reason for the following

(4)

- a) Ionic compounds have high melting point
- b) blue colour of aq.  $\text{CuSO}_4$  -turns almost colourless on its electrolysis using Pt electrode.

iii) Name the following:

(2)

- a) A base which is insoluble in water
- b) A normal salt of sodium formed from acetic acid.

### Question 7

- i) A compound has the following % composition. Zn=22.65%; S= 11.15%; O=61.32% and H=4.88%

Its relative molecular mass is 287. Calculate its molecular formula assuming that all the hydrogen in the compound is present in combination with oxygen as water of crystallization.

(Zn=65, S=32, O=16, H=1) (3)

- ii) Give reasons for the following: (4)

a) People suffering from acidity are advised to drink cold milk.

b) The atomic size increases as we move down the group.

- iii) Compare the properties of covalent and electrovalent compounds on the following points:

a) Solubility

b) Structure

- iv) What do you mean acid salt? (1)

### Question 8

- i) Write down the conditions for electroplating. (2)

- ii) Draw the structural isomers of  $C_5H_{12}$  (2)

- iii) Acetylene burns in air forming carbon dioxide and water vapour. Calculate the volume of air required to completely burn 100 cm<sup>3</sup> of acetylene. (Assuming air contains 20% oxygen) (2)

- iv) Give reasons for the following (3)

a) Sulphurous acid forms two types of salts on reaction with an alkali.

b) Sodium chloride will conduct electricity only in fused or aqueous solution state

- v) State your observations: when excess ammonium hydroxide is added to  $CuSO_4$  solution

(1)