



KARNATAKA ICSE SCHOOLS ASSOCIATION

ICSE STD. X Preparatory Examination 2024

Subject: CHEMISTRY (SCIENCE PAPER 2)

Maximum Marks: 80

Time Allowed: Two hours

Date: 30-01-2024

General Instructions:

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

You will not be allowed to write during first 15 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**.

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

SECTION A

(Attempt **all** questions from this Section.)

Question 1

Choose the correct answers to the questions from the given options. [15]

(Do not copy the question, write the correct answers only.)

- i. Electrolysis of acidified water produces Oxygen gas at the anode.
Which of the following ions move towards the anode?
P. SO_4^{2-}
Q. OH^{1-}
R. O^{2-}
 - (a) Only R
 - (b) Both P and R
 - (c) Both P and Q
 - (d) Only Q

- ii. A compound X is heated in a dry test tube. The gas liberated is passed into another test tube containing potassium iodide solution that produces violet vapours. The liberated gas could possibly be?
 - (a) Oxygen
 - (b) Nitrogen dioxide
 - (c) Chlorine
 - (d) Sulphur dioxide



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iii. The atomic masses of oxygen(O), fluorine(F) and neon(Ne) are 16, 19 and 20 respectively.

Which of the following statements regarding the volume of gases at STP in 16 g of oxygen, 19 g of fluorine and 20 g of neon is correct?

M. 16 g of oxygen will occupy half the volume occupied by 20 g of neon.

N. 20 g of neon will occupy twice the volume occupied by 19 g of fluorine.

- (a) Both M and N
- (b) Only M
- (c) Only N
- (d) Neither M nor N

iv. Hydrogen chloride gas is passed through conc. sulphuric acid and collected in a jar. Moist blue litmus paper is exposed to the gas in the jar. What do you observe?

- (a) It remains blue.
- (b) It gets bleached
- (c) It turns red
- (d) It turns red then gets bleached

v. Sulphur reacts with hot conc. nitric acid producing sulphuric acid, water and nitrogen dioxide. The property of nitric acid emphasised here is

- (a) Acid property
- (b) Oxidizing nature
- (c) Reducing nature
- (d) Dehydrating property

vi. Which among the following conditions does not hold true for electroplating?

- (a) Direct current should be used.
- (b) The electrolyte must contain ions of the base metal to be electroplated.
- (c) A low current for a prolonged period of time must be used.
- (d) The metal to be plated on the article is made the anode.

vii. The acidity is 3 for

- (a) Ammonium hydroxide
- (b) Copper hydroxide
- (c) Zinc hydroxide
- (d) Ferric hydroxide



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viii. $A \rightarrow A^{-3}$; $B \rightarrow B^{+2}$

Number of electron present in the valence shell and the type of element of atoms A and B respectively are:

	Number of electrons in valence shell	Type of Elements
W	3,2	Non-metal, non-metal
X	5,2	Non-metal, metal
Y	3,6	Metal, non-metal
Z	5,3	Non-metal, metal

- (a) W
- (b) X
- (c) Y
- (d) Z

ix. Salt of Fe^{2+} ion will be of the colour

- (a) Green
- (b) Brown
- (c) Pink
- (d) Yellow

x. An element with atomic number _____ will form a base when its oxide is dissolved in water.

- (a) 17
- (b) 7
- (c) 15
- (d) 19

xi. Reaction between ammonia and chlorine produces a yellow explosive liquid of nitrogen trichloride. The ratio of ammonia: chlorine is

- (a) 1:2
- (b) 2:1
- (c) 1:3
- (d) 3:1



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- xii. -CHO functional group is present in
- Butanal
 - Ethanol
 - Propanone
 - Methanoic acid
- xiii. $\text{Cu}^{2+} \rightarrow \text{Cu}$. This is an example for
- Oxidation
 - Reduction
 - Redox reaction
 - None of the above
- xiv. The promoter used in Haber's process
- Pt
 - Fe
 - K_2O
 - Mo
- xv. A negative divalent element will belong to which group?
- Group 2
 - Group 13
 - Group 14
 - Group 16

Question 2

- i. Complete the following sentences by choosing the correct answers from the brackets: [5]
- If an element has seven valence electrons then it is likely to have the _____ (smallest/largest) electron affinity among all the elements in the same period.
 - _____ (Acetic acid / phosphoric acid) forms two acidic salts.
 - A _____ (Chalky/gelatinous) white precipitate is formed when sodium hydroxide is added to a solution of lead nitrate.
 - _____ (Alkynes/ Alkanes) undergo characteristic addition reaction.
 - An _____ (Alkaline/acidic) solution will turn alkaline phenolphthalein colourless.



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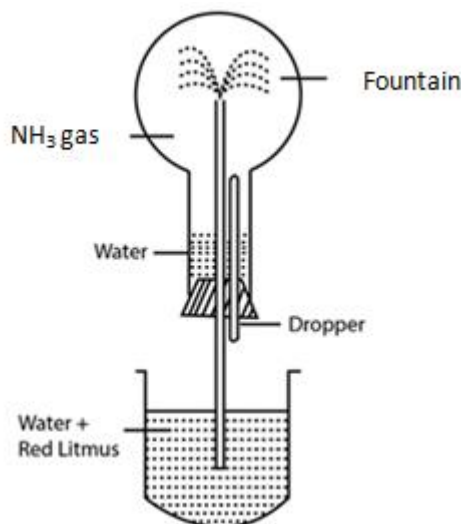
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- ii. The setup shown below is that of the fountain experiment with ammonia gas in the flask. [5]



The fountain starts when a few drops of water from the dropper are introduced into the flask. Answer the following questions:

- Explain why the litmus solution gets sucked up when water is used?
 - What will be the colour of the fountain? Justify your answer.
 - Instead of ammonia if hydrogen chloride gas was filled in the flask and an alkali was introduced from the dropper. Will there be a different observation? Justify your answer.
- iii. Match the following Column A with Column B. [5]

Column A	Column B
(a) Calcium oxide	1. Covalent Compound
(b) Ammonia	2. Dehydrating agent
(c) Water	3. Haber's process
(d) Froth Flotation	4. Electrovalent Compound
(e) Conc. Sulphuric Acid	5. Sulphide ore

- iv. Identify the following: [5]
- The number of electrons donated or accepted by the valence shell of an atom of an element so as to achieve stable electronic configuration.
 - The number of hydrogen ions which can be produced per molecule of an acid in aqueous solution.



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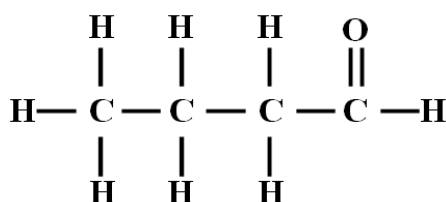
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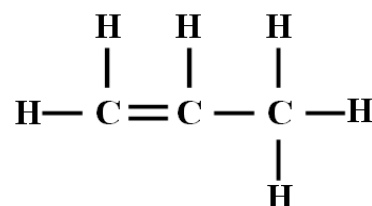
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- (c) Aliphatic, open chain organic compounds containing – carbon and hydrogen only.
- (d) The positive charge on the nucleus of an atom.
- (e) The naturally occurring minerals from which metals can be extracted profitably and conveniently.
- v. (a) Draw the branched structural formula for the following compounds: [5]
- 2, 2-Dichloro Butane
 - 2-Pentyne
 - Propanoic acid
- (b) Give the IUPAC name of the following organic compound:

1.



2.



SECTION B

(Attempt **any four** questions from this Section.)

Question 3

- i. Identify the reactant and write a balanced equation for the following: [2]
Hydrochloric acid reacts with a compound Z to give a salt MgCl_2 , water and sulphur dioxide.
- ii. What property of ammonia is exhibited in each of the following cases: [2]
- Its aqueous solution reacts with salt solution of Fe^{2+} ion producing a precipitate and a soluble salt.
 - Its reaction with copper oxide producing copper along with water and nitrogen gas.
- iii. The electronegativity of element X is greater than that of element Y. [3]
- The reducing power of Y is _____ (more/less) as compared to X.
 - The electron affinity of Y is _____ (more/less) as compared to X.
 - State whether Y is likely to be placed to the left or to the right of X in the periodic table.



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- iv. (a) State whether the following statements are TRUE or FALSE. Justify your answer: [2]
1. In the formation of J_2M , the element M has accepted 2 electrons and its metallic in nature.
 2. In the formation of a covalent compound, if the molecule consists of a double bond then the shared pair of electrons is three pairs.
- (b) Calculate the number of molecules in 15 grams of sulphur dioxide. [RMM of sulphur dioxide = 64] [1]

Question 4

- i. The following questions relate to the extraction of Aluminium: [2]
- a) Name the chemical used in the concentration of the ore.
 - b) A layer of powdered coke is sprinkled over the electrolytic mixture. Give reason.
- ii. 35 g of a gas forms $15,000 \text{ cm}^3$ of vapours at STP. Calculate the molecular weight of the gas. [2]
- iii. Write the balanced chemical equation for each of the following: [3]
- a) Action of conc. sulphuric acid on sodium nitrate.
 - b) Catalytic oxidation of ammonia.
 - c) Dehydrohalogenation of 1, 2-Dibromo ethane with alcoholic potassium hydroxide.
- iv. With respect to Contact Process answer the following: [3]
- a) Catalyst used in the contact tower.
 - b) Temperature of the reaction in the contact tower.
 - c) Balanced equation for the formation of pyrosulphuric acid.

Question 5

- i. Ethan wants to differentiate between sulphur dioxide gas and hydrogen sulphide gas in the laboratory. He has been given moist lead acetate paper. [2]
- a) How will he differentiate the two gases?
 - b) What is the odour of hydrogen sulphide gas.
- ii. Name the alloy which is having the following metals as its main component: [2]
- a) Aluminium
 - b) Iron



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- iii. Dany takes a white powdered salt W in a test tube. On heating it produces a buff yellow residue. W is dissolved in water. Magnesium is added to one part of the solution and to the other part sodium sulphate solution is added. [3]
- Identify the compound W.
 - Name the salt obtained when magnesium is added to W.
 - Write the formula of the precipitate obtained when W is treated with sodium sulphate solution.
- iv. State scientific reasons for each of the following statements: [3]
- Alkenes are known as olefins.
 - Laboratory preparation of alkanes from sodium acetate is called as decarboxylation.
 - In catalytic oxidation of ammonia, the platinum continues to glow even after the heating is discontinued.

Question 6

- i. Name the following: [2]
- The main ore of iron.
 - The ore of aluminium containing sodium.
- ii. State one observation in each of the following: [2]
- Conc. hydrochloric acid is added to manganese dioxide.
 - Hydrogen chloride gas is passed through silver nitrate solution.
- iii. Acidified water is electrolysed using platinum electrode. [3]
- At which electrode does hydrogen gas gets released?
 - The current is passed for a prolonged period of time before collecting the gases. Why?
 - Write the reaction that takes place at anode.
- iv. X [2, 8, 5] and Y [2, 8, 3] are two elements. Using the information complete the following: [3]
- Metal atoms tend to _____ electrons to achieve stable electronic configuration.
 - _____ will form trivalent negative ion/radical.
 - _____ is an oxidizing agent.



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Question 7

- i. The empirical formula of an organic compound is CHCl_2 and its molecular weight is 168. Find the molecular formula. [3]
[Atomic weights; C-12; H-1; Cl-35.5]
- ii. Joel prepared a solution R that has a pH 7. [2]
What will be the effect on the pH on addition of the following?
 - a) Sodium hydroxide solution.
 - b) An acidic solution.
- iii. Which is the most electronegative element in period 2? [1]
- iv. 12.6g of Copper oxide is obtained on thermal decomposition of copper carbonate. [4]
 $\text{CuCO}_3 \rightarrow \text{CuO} + \text{CO}_2$
Calculate the following:
 - a) Mass of copper carbonate initially taken.
 - b) Volume of carbon dioxide at STP.

[Atomic weights: Cu-63.5; C-12; O-16]

Question 8

- i. Differentiate between the following on the basis of the parameters given in the brackets: [2]
 - a) Ferrous sulphate and ferric chloride (Sodium hydroxide solution)
 - b) Acidic and alkaline solutions (addition of sodium carbonate)
- ii. Draw the electron dot structure for ammonium ion. [2]
- iii. Write the balanced chemical equation for the following: [3]
 - a) Laboratory preparation of ammonia from magnesium nitride.
 - b) Conversion of ethyl alcohol to ethyl ethanoate.
 - c) Complete oxidation of ethane.
- iv. Identify the following: [3]
 - a) The oxidizing electrode.
 - b) The acidic gas produced when sodium sulphide reacts with dilute hydrochloric acid.
 - c) Type of acid that does not produce acidic salts.