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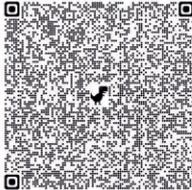
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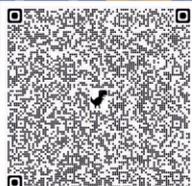
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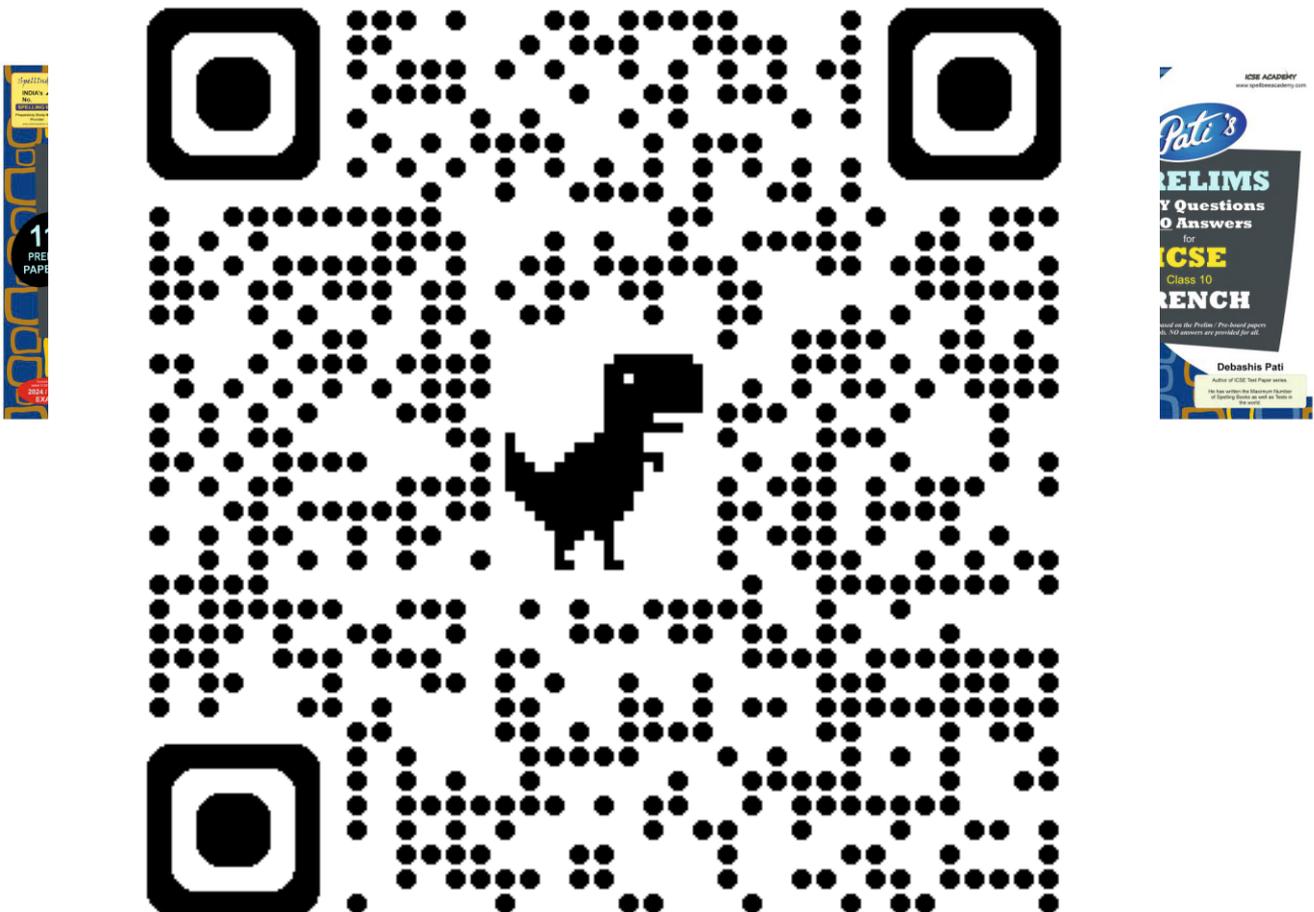
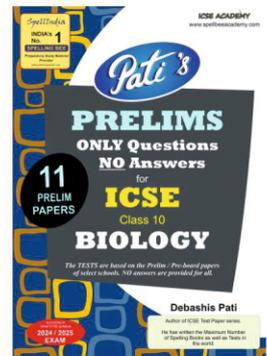
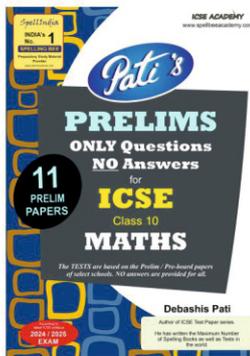
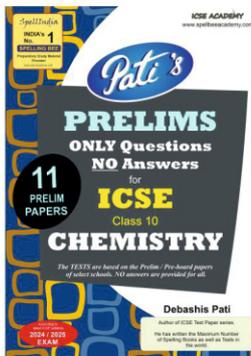
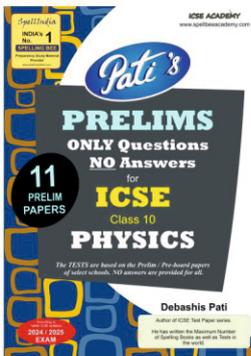
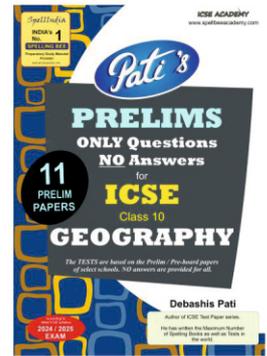
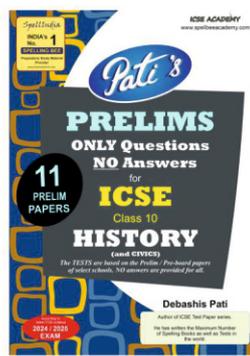
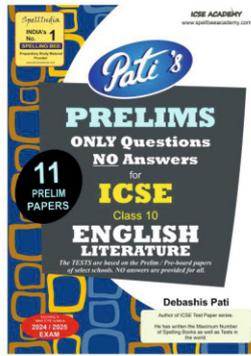
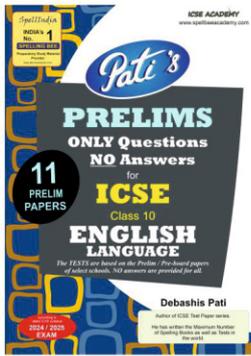
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# ST. GREGORIOS HIGH SCHOOL

## PRELIMINARY EXAMINATION CHEMISTRY SCIENCE PAPER-2

Std: X  
Date: 07.01.2026

No. of pages: 12

Marks: 80  
Time: 2 hours

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

You will not be allowed to write during the 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 the questions or parts of questions are given in brackets [ ]

### SECTION A

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

#### Question 1

Choose the correct alternative:

[15]

- (i) An acid which dissociates only partially in aqueous solution is a
- (a) Strong acid
  - (b) Weak acid
  - (c) Dilute acid
  - (d) Concentrated acid

- (ii) The gas which is collected by downward displacement of air is:
- (a) Hydrogen
  - (b) Hydrogen chloride
  - (c) Ammonia
  - (d) Nitrogen
- (iii) Hydronium ion is formed when a molecule of water combines with:
- (a) a hydrogen atom
  - (b) a proton
  - (c) an electron
  - (d) a hydrogen molecule
- (iv) The observation when ammonium chloride reacts with sodium hydroxide:
- (a) A reddish brown gas which turns starch iodide paper blue black
  - (b) A colourless gas which turns moist red litmus blue.
  - (c) A greenish yellow gas which turns moist blue litmus paper red
  - (d) A colourless gas which turns lime water milky.
- (v) The most electronegative element is:
- (a) helium
  - (b) fluorine
  - (c) chlorine
  - (d) bromine

Identify one statement that does not hold true for the electroplating using silver:

- (a) The electrolyte is aqueous silver nitrate.
- (b) The anode diminishes in mass.
- (c) The current should be low and for a longer duration.
- (d) The article to be plated is placed at the cathode.

(vii) The colour change observed when the solution of magnesium hydroxide is tested with the following indicators:

- (a) phenolphthalein turns from colourless to pink.
- (b) methyl orange remains orange.
- (c) phenolphthalein remains colourless
- (d) blue litmus solution turns red.

(viii) The molecular formula of a hydrocarbon having vapour density 13 is \_\_\_\_.  
[C = 12, H = 1]

- (a)  $C_6H_6$
- (b)  $C_2H_2$
- (c)  $C_2H_6$
- (d)  $C_2H_4$

(ix) **Assertion (A):** Zinc hydrogen sulphite is an acid salt.

**Reason (R):** An acid salt is formed by complete replacement of the hydrogen ion of an acid by a basic radical.

- (a) Both A and R are true and R is the correct explanation of A.
- (b) Both A and R are true but R is not the correct explanation of A.
- (c) A is true but R is false.
- (d) A is false but R is true.

A compound having the shared pair of electrons unequally distributed between the two atoms could be:

- (a) Sodium chloride
- (b) Hydrogen chloride
- (c) Carbon tetrachloride
- (d) Methane

- (xi) \_\_\_\_\_ is an inorganic acid.
- (a) Formic acid
  - (b) Acetic acid
  - (c) Phosphoric acid
  - (d) Oxalic acid
- (xii) The conditions necessary for the manufacture of ammonia
1. 450 – 500°C
  2. Finely divided iron
  3. Potassium oxide
  4. Molybdenum
  5. 200 – 900 atmospheres
- (a) 1, 2, 3, 4
  - (b) 2, 3, 4, 5
  - (c) 1, 2, 4, 5
  - (d) 1, 3, 4, 5
- (xiii) Cathode is a reducing electrode because:
- (a) Cations lose electrons to the cathode.
  - (b) Cations gain electrons from the cathode.
  - (c) Cathode has excess electrons.
  - (d) Cathode has less number of electrons.
- (xiv) Which of the following is a non-electrolyte?
- (a) molten lead bromide
  - (b) aqueous copper sulphate
  - (c) pure or distilled water
  - (d) dilute sulphuric acid

(xv) **Assertion (A):** An inverted funnel arrangement is used for the preparation of hydrochloric acid.

**Reason (R):** To prevent or minimize back-suction

- (a) Both A and R are true and R is the correct explanation of A.
- (b) Both A and R are true but R is not the correct explanation of A.
- (c) A is true but R is false.
- (d) A is false but R is true.

### Question 2

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

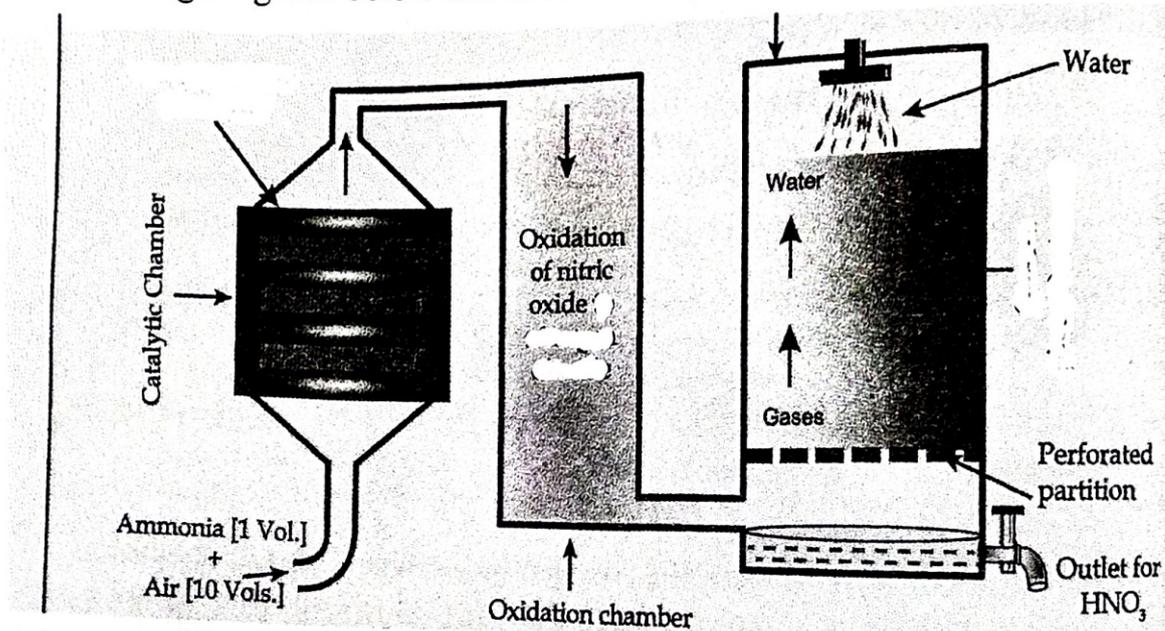
- (a) Undistilled alcohol containing large amounts of methanol is called \_\_\_\_\_ (spurious/ methylated) alcohol.
- (b) A dull white precipitate with sodium hydroxide indicates the presence of \_\_\_\_\_ ( $Mg^{+2}/ Zn^{+2}$ ) ion.
- (c) Duralumin is composed of \_\_\_\_\_ (Cu, Mg, Mn, Al/ Mg, Al)
- (d) The ammonia molecule has \_\_\_\_\_ (a single triple covalent bond/ three single covalent bonds).
- (e) \_\_\_\_\_ ( $SiO_2/ Al_2O_3$ ) is a covalent oxide of a metalloid.

(ii) Match the columns: [5]

	Column A		Column B
1.	Zinc + hydrochloric acid	(a)	Neutralisation
2.	Ammonium hydroxide + nitric acid	(b)	Displacement
3.	Lead nitrate + sodium sulphate	(c)	Direct combination
4.	Iron + sulphur	(d)	Action of dilute acids
5.	Copper hydroxide + sulphuric acid	(e)	Neutralisation by titration
		(f)	Precipitation

Study the figure given below and answer the questions that follow:

[5]



- Give balanced equations for the reactions taking place in the catalytic chamber and absorption tower.
- Why is a higher ratio of air used?
- What is the temperature in the oxidation chamber? Why?
- What is the absorption tower packed with? Why?

(iv) Identify the following:

- Preparation of alkynes using alkyl halides.
- The process by which an atom or ion loses electrons.
- The term for the number of atoms present in 12g of carbon.
- The process which involves separation of ions, taking place in electrovalent compounds.
- Condensation of an alcohol with an acid.

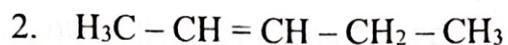
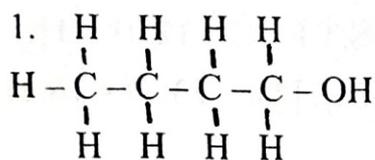
[5]

(v) (a) Draw the structural diagram for the following compounds:

- Neo-pentane.
- Propanoic acid
- Acetaldehyde

[5]

(b) Give the IUPAC name of the following organic compounds:



### SECTION B

(Attempt any four questions)

#### Question 3

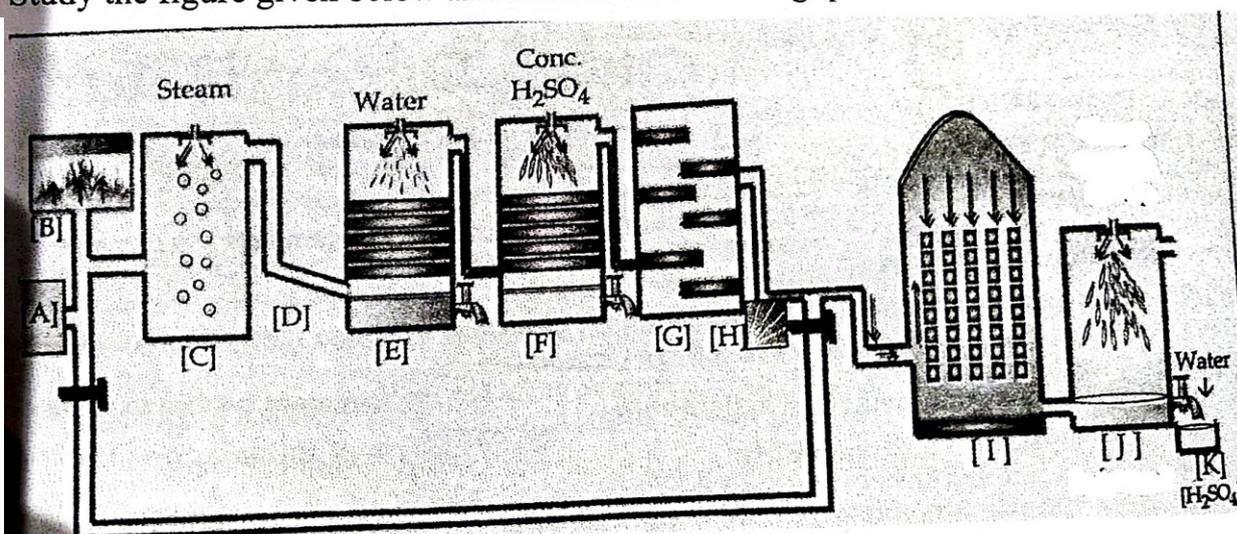
(i) Match the columns:

[2]

	Column A		Column B
1.	Pentyne	a.	$\text{C}_n\text{H}_{2n}$
2.	Methane	b.	$\text{C}_n\text{H}_{2n-2}$
3.	Methyl alcohol	c.	$\text{C}_n\text{H}_{2n+2}$
4.	Propene	d.	$\text{C}_n\text{H}_{2n+1}\text{OH}$

(ii) Study the figure given below and answer the following questions:

[3]



(a) Name the process.

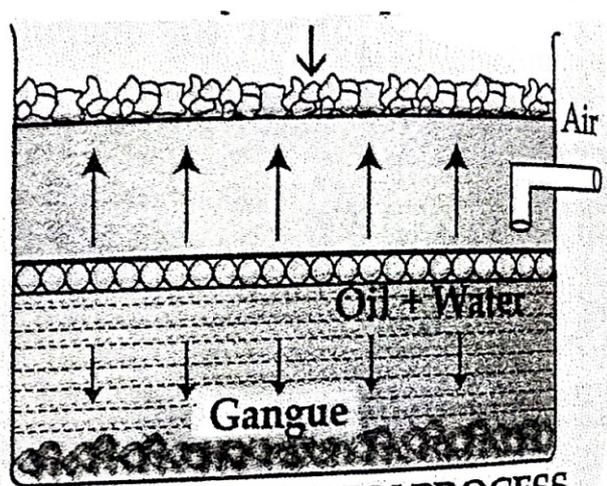
(b) What is the product in "J"?

(c) Give balanced equations for the reactions taking place in "I" and "J"

- (iii) Calculate: [2]
- (a) The volume occupied by 80g of methane at S.T.P. [C = 12, H = 1]
- (b) The number of moles present in 140g of NaOH. [Na = 23, O = 16, H = 1]
- (iv) Answer the following questions with reference to electrorefining of copper: [3]
- (a) What is used as the cathode and the anode?
- (b) Give the reaction at the anode.
- (c) What is anode mud?

#### Question 4

- (i) Give balanced equations for the following reactions: [3]
- (a) Preparation of methane from iodomethane.
- (b) Reaction between bromine and ethene.
- (c) Reaction between ethanol and acetic acid.
- (ii) Study the figure given below and answer the questions that follow: [2]



- (a) Name the method of separation.
- (b) State the principle on which this method of separation is based.  
This method is generally applied for \_\_\_\_\_ ores.

(iii) Differentiate between the following pairs based on the criteria given: [2]

- Sulphuric acid and nitric acid (using barium chloride solution)
- Calcium nitrate and lead nitrate (using sodium hydroxide)

(iv) Study the extract of the periodic table (letters do not represent exact symbols of elements) given below and answer the questions using only the alphabets in the table: [3]

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Z																	Y
X	W											V	U	T	S	R	Q
P	O											N	M	L	K	J	I
H	G																

Which element:

- Has the highest electron affinity?
- Has the highest ionization potential?
- Has the largest atomic size in period 3?
- would form an oxide which would react with an alkali?
- Has electronic configuration 2,8,8,2?
- belonging to the second period has valency – 3?

What would you observe in the following cases? [3]

Dilute sulphuric acid is added to iron(II) sulphide.

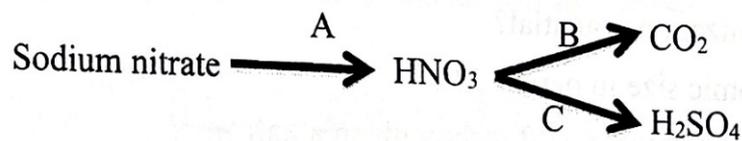
Dry ammonia gas is passed over heated lead oxide.

Concentrated nitric acid is added to copper.

- (ii) Give reasons for the following: [2]
- For dilution of concentrated sulphuric acid, the acid is added to water.
  - Quicklime is not used to dry hydrogen chloride.
- (iii) 'A' is a metal placed above hydrogen in the metal activity series.  $A_3N_2$  is the formula of the nitride of the metal. [3]
- What is the valency of metal A? Which group does it belong to?
  - Give formula of sulphide and chloride of metal A.
  - Name the metal in period 3 which belongs to the same group as metal A.
- (iv) Classify the following salts as soluble or insoluble: [2]  
*silver chloride, calcium sulphate, sodium carbonate, lead nitrate*

### Question 6

- (i) Give balanced equations for the following conversions A, B and C. [3]



- (ii) Draw the electron dot structures of the following: [3]
- ammonium ion.
  - carbon tetrachloride
  - potassium oxide
- (ii) Answer the following questions pertaining to the electrolytic reduction of alumina [2]
- Name the components of the electrolytic mixture.
  - What are the difficulties faced during this process?

- (iv) Differentiate between carbon tetrachloride and potassium chloride on the basis of electrical conductivity and the forces of attraction between constituent units [2]

**Question 7**

- (i) Copy and complete the paragraph by filling in the correct word from those given below: [2]

*Blue, green, red, yellow, violet*

Dilute hydrochloric acid will turn the pH paper \_\_\_\_\_ while lactic acid will turn it \_\_\_\_\_. Sodium hydroxide will turn pH paper \_\_\_\_\_ while pure water will turn it \_\_\_\_\_.

- (ii) 60 cc of oxygen reacts with 24 cc of methane [ $\text{CH}_4$ ] to liberate carbon dioxide, water vapour and heat energy. The container is cooled at the end of the reaction. Calculate the resultant composition of gases present in the container at the end of the reaction. Define the law used. [3]

- (iii) Explain the following: [3]

- (a) Dibasic acid.
- (b) Polar covalent compounds.
- (c) Electrochemical series.

- (iv) State the conditions for the following reactions: [2]

- (a) Preparation of ethyne using calcium carbide.
- (b) Hydrogenation of ethene.
- (c) Reaction of methane with chlorine.
- (d) Preparation of ethane using alkyl halide

**Question 8**

(i) A start up specializes in creating gold plated ornaments. To meet the increasing demand, the company decided to expand its operations. However, the company started receiving numerous customer complaints, as the quality of the gold plating was either thin or uneven. [2]

(a) What could be the reason for the poor quality?

(b) Explain the term electroplating.

(ii) Define: [3]

(a) Homologous series.

(b) Roasting.

(c) Electronegativity.

(iii) Fill in the blanks: [2]

Elements of group 1 are called \_\_\_\_\_. They are \_\_\_\_\_ conductors of heat and electricity and form \_\_\_\_\_ compounds with non-metals. They are \_\_\_\_\_ and can be cut with a knife.

(iv) Copper reacts with concentrated sulphuric acid to produce copper sulphate. [3]

(a) Give the balanced equation for the reaction.

(b) What role does sulphuric acid play in the reaction?

(c) Find the weight of copper sulphate formed when 1.92g of copper is used.

[Cu = 64, S = 32, O = 16]

## Question Paper 22

HIRANANDANI FOUNDATION SCHOOL, THANE

Second Preliminary Assessment – January 2026

Subject- Chemistry

Std: X

Date: 07/01/26

Time: 2 hrs

Max. Marks: 80

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

*You will not be allowed to write during the 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 [ ].*

*This Question paper consists of 9 printed pages.*

### SECTION A (40 Marks)

*(Attempt all questions from this Section)*

#### Question 1

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

[15]

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

(i) Which gas decolourises Potassium permanganate ( $\text{KMnO}_4$ ) solution ?

- (a) Sulphur dioxide
- (b) Ammonia
- (c) Hydrogen chloride
- (d) Carbondioxide.

(ii) A compound D is heated in a test tube with Sodium hydroxide solution. A red litmus paper held at the mouth of the test tube turns blue. Identify the compound D from the following.

- (a) Barium sulphate
- (b) Potassium sulphate
- (c) Ferric sulphate
- (d) Ammonium sulphate

(iii) Assertion (A): Aqueous solution of Potassium chloride can conduct electricity.

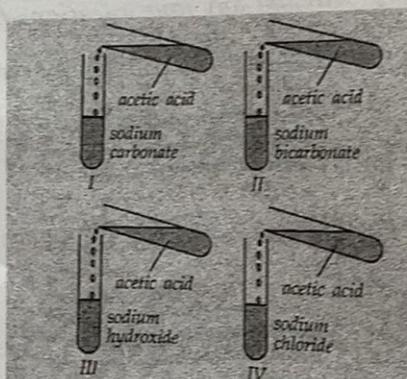
Reason (R) : Conduction of electric current is due to presence of free ions.

- (a) (A) is true and (R) is false.
- (b) (A) is false and (R) is true.
- (c) Both (A) and (R) are true and (R) is the correct explanation of (A).
- (d) Both (A) and (R) are true, but (R) is not the correct explanation of (A).

(iv) Which of the following ions will readily discharge at the anode during the electrolysis of acidulated water .

- (a)  $\text{OH}^-$
- (b)  $\text{SO}_4^{2-}$
- (c)  $\text{Cl}^-$
- (d)  $\text{H}^+$

(v) A student added acetic acid to test tubes I, II, III and IV and then introduced a burning candle near the mouth of each test tube. The candle would be extinguished near the mouth of test tubes \_\_\_\_\_



- (a) I and II
- (b) I and III
- (c) II and III
- (d) III and IV

(vi) The anion discharged at the anode with most difficulty is \_\_\_\_\_

- (a)  $\text{SO}_4^{2-}$
- (b)  $\text{Br}^-$
- (c)  $\text{NO}_3^-$
- (d)  $\text{OH}^-$

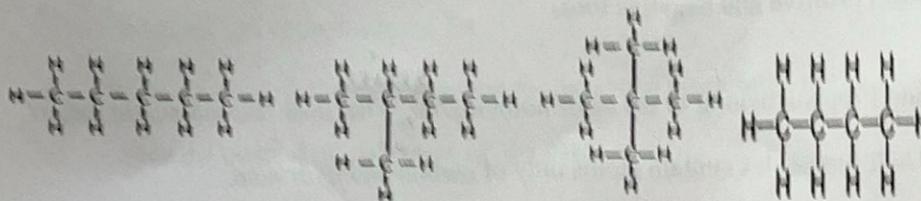
(vii) The vapour density of water is \_\_\_\_\_. [At.wt of H=1, O = 16]

- (a) 18
- (b) 9
- (c) 36
- (d) 44

10) A gas which does not conduct electricity in liquid state but conducts electricity when dissolved in water.

- (a) HCl
- (b) SO<sub>2</sub>
- (c) CO<sub>2</sub>
- (d) N<sub>2</sub>

(ix) The structures of four hydrocarbons are shown below:



How many isomers of pentane are shown in the above structures ?

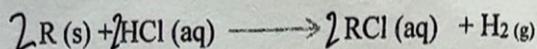
- (a) 1
  - (b) 2
  - (c) 3
  - (d) 4
- (x) An element with atomic number 19 will most likely combine chemically with the element whose atomic number is :
- (a) 17
  - (b) 11
  - (c) 18
  - (d) 20
- (xi) The table given below provides the pH value of four solutions P, Q, R and S:

Solution	P	Q	R	S
pH	2	9	5	11

Which of the following correctly represents the solution in the increasing order of their hydrogen ion concentration ?

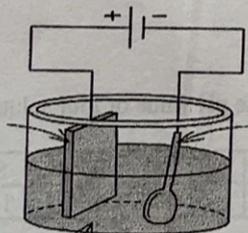
- (a) P > Q > R > S
- (b) P > R > Q > S
- (c) S > Q > R > P
- (d) S > P > Q > R

- (xii) The equation below shows the reaction between element 'R' and dilute hydrochloric acid



Which particles are responsible for conducting electricity in dilute hydrochloric acid and compound RCl?

- (a) Electrons  
 (b) Only positive ions  
 (c) Only negative ions  
 (d) Both positive and negative ions.
- (xiii) Ethene and Propene belong to the same homologous <sup>series</sup>. What does this statement mean?
- (a) Their molecules contain atoms only of carbon and hydrogen.  
 (b) Their molecules have the same number of carbon atoms.  
 (c) They have the same functional group.  
 (d) They have the same relative molecular mass.
- (xiv) The ratio between the number of molecules in 2g of hydrogen and 32 g of oxygen is :
- (a) 1:2  
 (b) 1:001  
 (c) 1:1  
 (d) 0.1:1
- (xv) In the process of electroplating of an article, with silver as shown in the diagram below, which of the following statements is correct?



- (a) The anode is made of an impure Silver rod.  
 (b) The article to be plated is made the cathode.  
 (c) Sodium is plated on the article.  
 (d) Electrolyte used is Copper (II) sulphate.

Question 3

- (i) The diagram shown below is an experimental set up for the laboratory preparation of pungent smelling gas. The gas is alkaline in nature. [5]

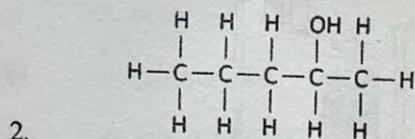
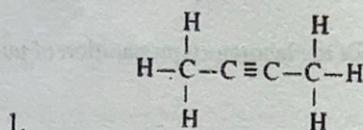


- (a) Name the gas collected in the jar.
- (b) Write a balanced chemical equation for the above preparation of the gas.
- (c) State the method of collection of the gas.
- (d) Name the drying agent used to dry the gas.
- (e) Explain why the gas is not collected over water.
- (ii) Identify the following: [5]
- (a) The charged particles which attract one another to form an electrovalent compound.
- (b) The acid which contains four hydrogen atoms in its molecule.
- (c) The chemical reagent used to distinguish Ethane and Ethene.
- (d) The amount of energy released when an atom in the gaseous state accepts an electron.
- (e) A homogenous mixture of metals or non -metals to get the desired properties.
- (iii) Complete the following by choosing the correct answers from the bracket: [5]
- (a) \_\_\_\_\_ is an insoluble salt. (  $\text{CuSO}_4$  /  $\text{PbSO}_4$  )
- (b) \_\_\_\_\_ (  $\text{N}_2$  /  $\text{Cl}_2$  ) gas is produced when excess ammonia gas reacts with chlorine.
- (c) A metal whose salt solution does not produce any water soluble salt with excess Sodium hydroxide solution is \_\_\_\_\_ ( zinc / Copper ).
- (d) The functional group present in the Propanoic acid is \_\_\_\_\_.(  $-\text{COOH}$  /  $-\text{CHO}$  )
- (e) The non -metallic character of the elements down the group \_\_\_\_\_.( decreases/increases )
- (iv) Match column A with column B. [5]

Column A	Column B
a. Trichloromethane	1. Magnesium nitride
b. Nitric acid	2. Calcium carbide
c. Ammonia	3. Sodium chloride
d. Ethyne	4. Methane
e. Hydrogen chloride	5. Potassium nitrate

(v) (a) Give the IUPAC names of the following organic compounds:

[5]



(b) Draw the structural diagram for the following compounds:

1. Propene
2. 2,2- Dimethylpropane
3. Ethanal

SECTION B (40 Marks)  
(Attempt any four questions)

Question 3

- (i) Give one significant observation when : [2]
- (a) Ammonia gas is burnt in an atmosphere of oxygen in the absence of catalyst.
  - (b) Copper oxide is added to dilute sulphuric acid slowly and stirred.
- (ii) Give reasons: [2]
- (a) Quick lime is the only drying agent used for drying ammonia gas .Why?
  - (b) Conductivity of dilute hydrochloric acid is greater than that of acetic acid.
- (iii) The electronegativity of an element 'A' is greater than that of 'B'. [3]
- (a) How is the ionisation potential of 'A' likely to compare with that of 'B'?
  - (b) Which amongst the two will have more nonmetallic character ?
  - (c) State whether 'A' is likely to be placed to the left or to the right of 'B' in the Periodic Table.
- iv) Using suitable chemicals from the list given in the box, write balanced chemical equation for the preparation of salts mentioned below: [3]

Potassium bicarbonate, nitric acid, iron, aluminium, sulphuric acid, Lead(II) hydroxide, Sodium hydroxide, Sodium carbonate, Chlorine.

- (a) Lead nitrate
- (b) Aluminium chloride.
- (c) Potassium sulphate

**Question 4**

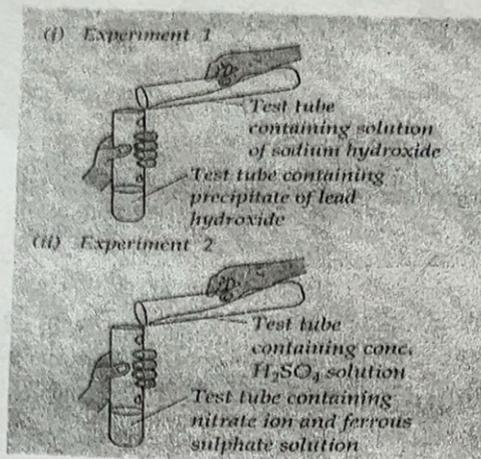
- (i) Name the main metal present in the following alloys: [2]
- (a) Bronze
  - (b) Stainless Steel.
- (ii) Write balanced chemical equations for the following: [2]
- (a) The laboratory preparation of Hydrochloric acid
  - (b) Preparation of Ethane from Sodium propionate.
- (iii) Smita was given a white coloured salt 'A' for analysis. On strong heating, it produced a residue which is yellow when hot and white when cold, a colourless gas and a reddish-brown gas. The solution of salt 'A' when tested with excess of ammonium hydroxide produced a colourless solution. [3]
- (a) Name the salt taken by Smita.
  - (b) Name the colourless gas produced on heating.
  - (c) Name the soluble salt formed with excess of ammonium hydroxide.
- (iv) In a round bottom flask a mixture of ethanol, acetic acid and conc. sulphuric acid was heated together. [3]
- (a) Write the name of the reaction taking place in the round bottom flask.
  - (b) State one observation taking place during the reaction.
  - (c) Write the IUPAC name of the product which is formed.

**Question 5**

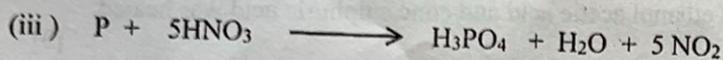
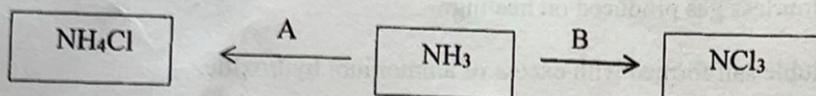
- (i) Identify the reactant and write the balanced equation for the following: [2]
- Hydrochloric acid reacts with a solution of compound X to produce a white precipitate which is soluble in hot water.
- (ii) Find the number of moles and molecules present in 7.1g of  $\text{Cl}_2$  (At. wt. of Cl = 35.5) [2]
- (iii) State the property exhibited by the compounds mentioned in the brackets in each of the following reactions: [3]
- (a) Copper with conc. Nitric acid. (Nitric acid)
  - (b) Ammonia with Lead oxide. (Ammonia)
  - (c) Ethanol is heated in presence of Aluminium oxide at  $350^\circ\text{C}$  (Aluminium oxide.)
- (iv) Give balanced equation for the following: [3]
- (a) Conversion of Bromo ethane to ethene.
  - (b) Preparation of Sodium ethoxide from ethanol.
  - (c) Reaction of Potassium sulphide with sulphuric acid.

**Question 6**

- (i) A student Anna was asked to perform two experiments in the laboratory. Observe the picture given below and state one observation for each of the experiments 1 and 2. [2]



- (ii) Give balanced chemical equations for the following conversions. (A & B) [2]



If 9.3 g of Phosphorus was used in the reaction, calculate [3]

- The number of moles of Phosphorus taken.
  - The mass of Phosphoric acid formed
  - Volume of Nitrogen dioxide at STP
- (iv) Identify the reactants X, Y, Z in the following reactions: [3]
- $X + \text{Ammonium sulphate} + \text{Ammonium hydroxide} \longrightarrow \text{Tetra amino copper (II) Hydroxide}$
  - $Y \xrightarrow{\Delta} \text{Copper oxide (black residue)} + \text{Carbon dioxide.}$
  - $Z + \text{Ammonium hydroxide} \longrightarrow \text{Ferrous hydroxide} + \text{Ammonium sulphate.}$

**Question 7**

- (i) Give reasons for the following: [2]
- Explain why Ammonium nitrate is not used in the preparation of ammonia gas in the laboratory.
  - A solution of Sodium chloride is an electrolyte while methyl chloride is not.
- (ii) The following questions are related to the extraction of Aluminium by electrolysis. [2]
- What is the role of Cryolite, in the extraction of Aluminium from its ore.
  - Give a balanced equation for the reaction that takes place at the anode.

(iii) Give balanced equation for each of the following: [3]

- (a) Conversion of an impure Bauxite ore to Sodium aluminate.
- (b) Action of cold dilute Nitric acid on copper metal
- (c) Hydrogenation of Ethene.

(iv) Solution A, B and C have pH 1, 7 and 14 respectively. [3]

- (a) \_\_\_\_\_ will liberate carbon dioxide gas when treated with Potassium carbonate.
- (b) \_\_\_\_\_ will liberate ammonia gas when reacted with Ammonium sulphate.
- (c) \_\_\_\_\_ will not show any colour change on addition to the universal indicator.

### Question 8

(i) State giving reasons: [2]

- (a) Sodium nitrate solution and Sodium chloride solution can be distinguished using Silver nitrate solution.
- (b) Lead metal and zinc metal can't be distinguished by heating the metal powder separately into two different test tubes with concentrated Sodium hydroxide solution.

(ii) Draw the electron dot structural formula of Ethyne. [2]

(iii) A hydrocarbon of vapour density 15 has 80% Carbon. Calculate the molecular formula of the Hydrocarbon. [At. wt C= 12, H=1] [3]

(iv) P, Q and R are three elements with atomic numbers 6, 9 and 17 respectively. Answer the following questions using only the alphabets given. Do not identify the elements. [3]

Which element:

- (a) exhibits the property of catenation.
- (b) in the gaseous form turns moist Starch iodide paper blue black.
- (c) has the highest electronegativity.



# UNIVERSAL HIGH SCHOOL

Daftary Road, Near Railway Station, Malad (East), Mumbai-400097

Tel:-28881008/9

**PRELIM 2 - 2025 - 2026**

**CHEMISTRY**

**Time allowed: Two hours**

**Class: X**

**Date: 17/01/2026**

**Marks: 80**

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

**You will not be allowed to write during the 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 (40 Marks)

(Attempt all questions from this Section.)

### Question 1

Choose the correct answers to the questions from the given options.

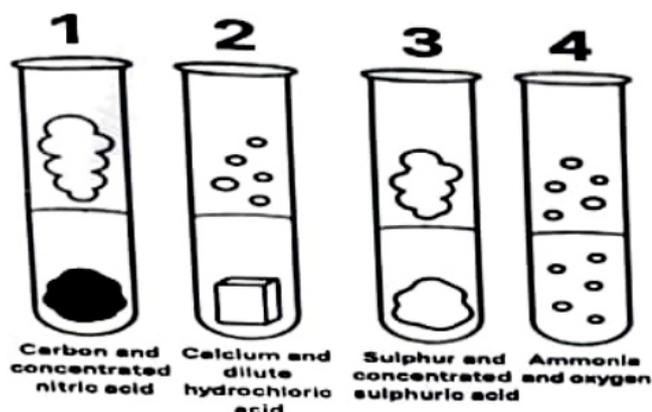
(Do not copy the question, write the correct answers only.)

[15]

- (i) Identify the weak electrolyte from the following:
- (a) Carbonic acid
  - (b) Sodium chloride
  - (c) Potassium hydroxide
  - ~~(d) Alcohol~~
- (ii) Chlorine reacts with excess ammonia to form:
- (a) Trinitrogen dichloride
  - ~~(b) Nitrogen trichloride~~
  - (c) Ammonium tetrachloride
  - (d) Ammonium chloride
- (iii) Which of the ions discharges easily:
- (a)  $Zn^{2+}$
  - ~~(b)  $Cu^{2+}$~~
  - (c)  $Al^{3+}$
  - ~~(d)  $Na^{+}$~~
- (iv) Which of the following is a common characteristic of a covalent compound?
- (a) High melting point
  - (b) Always soluble in water
  - (c) Consists of molecules
  - ~~(d) Conducts electricity when it is in the molten state~~

- (v) Nessler's reagent is used to identify:  
(a) Nitrogen dioxide  
(b) Hydrogen chloride  
 (c) Ammonia  
(d) Chlorine
- (vi) A compound of iron used in the manufacture of sulphuric acid:  
 (a)  $\text{FeS}_2$   
(b)  $\text{FeS}$   
(c)  $\text{Fe}_2\text{S}_3$   
(d)  $\text{FeCl}_2$
- (vii) The number of moles in 7g of nitrogen [ $N=14$ ] is:  
 (a) 0.25  
(b) 0.5  
(c) 0.75  
(d) 2
- (viii) A chloride which forms reddish brown precipitate with sodium hydroxide solution:  
 (a) Ferric chloride  
(b) Ferrous chloride  
(c) Lead chloride  
(d) Copper chloride
- (ix) The electrolyte used for electroplating an article with silver is:  
(a) Silver nitrate solution  
(b) Silver cyanide solution  
(c) Silver argento cyanide solution  
 (d) Sodium argento cyanide solution
- (x) Element Q has electronic configuration 2,8,2. The number of chlorine atoms present in the chloride of element Q is:  
(a) 1  
 (b) 2  
(c) 3  
(d) 4
- (xi) The method used to prepare ferrous chloride from iron is:  
 (a) Displacement reaction  
(b) Direct combination  
(c) Neutralisation  
(d) precipitation

1) Four reactions are shown below in the diagram. Which reaction produce hydrogen gas?



- (a) 1  
(b) 3  
~~(c) 4~~  
(d) 2

(xiii) **Assertion(A):** Methane is a saturated hydrocarbon.

**Reason(R):** Methane contains carbon-carbon double bond.

- (a) Both A and R are true and R is the correct explanation of A.  
(b) Both A and R are true but R is not the correct explanation of A.  
~~(c) A is true but R is false.~~  
(d) A is false but R is true

(xiv) Which of the following has the largest number of atoms?

[Li=7, Mg=24, Cl=35.5, H=1]

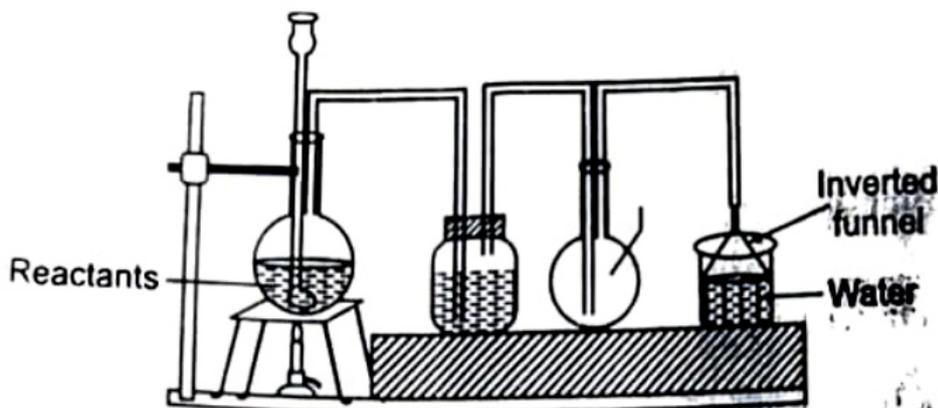
- (a) 7 g of Lithium  
(b) 4g of Hydrogen  
(c) 48 g of Magnesium  
(d) 71 g of Chlorine

(xv) When treated with NaOH, which of the following forms sodium plumbite and water:

- ~~(a) Pb~~  
(b) Al  
(c)  $Al_2O_3$   
(d) PbO

**Question 2**

- (i) The given figure shown is for the preparation of an acid. Answer the following questions. [5]



- (a) Name the acid prepared by this method.  
 (b) Write the chemical equation.  
 (c) What is the drying agent used?  
 (d) Why is this drying agent used?  
 (e) What is the role of inverted funnel arrangement?
- (ii) Identify the following: [5]
- (a) The type of chemical bonding present in metallic chloride.  
 (b) The tendency of an element to form chains of identical atoms.  
 (c) The common name of ore of zinc containing its sulphide.  
 (d) The amount of energy released when an atom in the gaseous state accepts an electron to form an anion.  
 (e) The salt formed by partial replacement of hydroxyl radicals of a diacidic base with an acid radical.
- (iii) Complete the following by choosing the correct answers from the bracket: [5]
- (a) Aluminium reacts with aqueous sodium hydroxide to form \_\_\_\_\_  
 ( $\text{Al}(\text{OH})_3$  /  $\text{NaAlO}_2$ )  
 (b) Sodium chloride has \_\_\_\_\_ (High / Low) melting point.  
 (c) Manganese dioxide reacts with conc. HCl to give \_\_\_\_\_ ( $\text{O}_2$  /  $\text{Cl}_2$ ) gas.  
 (d) If the atomic number of an element is 16, then the element belongs to \_\_\_\_\_  
 (Period 2 / Period 3) in the periodic table.  
 (e) \_\_\_\_\_ (Froth Flotation / Hydrolytic) method is generally applied for sulphide ores.

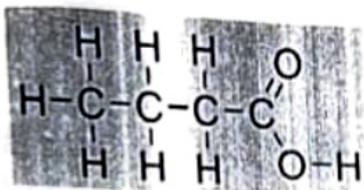
- (iv) Match Column A with Column B. [5]

Column A	Column B
(a) Hall -Heroult's Process	1. Sulphide Ore
(b) Bauxite	2. Inert electrode
(c) Nitric Acid	3. Main ore of Aluminium
(d) Roasting	4. Electrolytic reduction of Alumina
(e) Platinum	5 Ostwald's Process

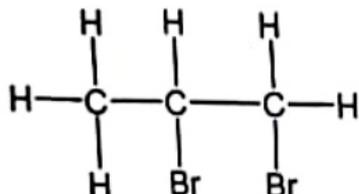
(a) Give the IUPAC name of the following organic compounds:

[5]

1.



2.



(b) Draw the structural diagram for the following compounds:

1. Propan-2-ol
2. Pent-2-yne
3. 2,3-dimethyl butane

**Section B (40 Marks)**

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

**Question 3**

- (i) Give one significant observation when: [2]  
 (a) Lead nitrate is strongly heated in a test tube.  
 (b) Ammonia burns in excess oxygen in the absence of catalyst.
- (ii) Give reasons for the following: [2]  
 (a) Graphite anode is preferred in the electrolysis of fused lead bromide.  
 (b) Liquid ammonia is used as a refrigerant in ice plants.
- (iii) The ionisation potential of an element **A** is less than that of element **B** in the periodic table. [3]  
 (a) How is the atomic radius of **A** likely to compare with that of **B**.  
 (b) How is the electron affinity of **A** likely to compare with that of **B**?  
 (c) State whether **A** is likely to be placed to the left or to the right of **B** in the periodic table?
- (iv) Write balanced chemical equations for the following reactions: [3]  
 (a) Sulphur reacts with concentrated nitric acid.  
 (b) Ammonia reacts with excess chlorine.  
 (c) Dilute sulphuric acid reacts with sodium carbonate.

**Question 4**

- (i) State the composition of the following alloys. [2]  
 (a) Bronze  
 (b) Duralumin

- (ii) Write balanced chemical equation for the preparation of each of the following:
- Fruity smell is produced when two organic compounds react.
  - Preparation of ethyne by dehydrohalogenation reaction.
- (iii) Raksha was given a salt 'P' for analysis. On strong heating, it produced a black residue and a colourless gas that turns lime water milky and has no effect with acidified potassium dichromate solution. The solution of the salt 'P' when tested with sodium hydroxide solution produced pale blue precipitate. [3]
- Name the colourless gas evolved upon strong heating.
  - Which cation is present in salt 'P'?
  - Identify salt 'P'.
- (iv) Ethyl alcohol and concentrated sulphuric acid are heated in a round bottom flask. [3]
- State the type of reaction occurring in the above reaction.
  - What is the role of sulphuric acid in this reaction?
  - Name the gas prepared in the above reaction.

### Question 5

- (i) Identify the **reactant** and write the balanced **equation** for the following: [2]  
Dilute Sulphuric Acid reacts with compound **X** to give sodium sulphate and hydrogen sulphide.
- (ii) If 16.4 gm of calcium nitrate is heated: [2]  
 $2\text{Ca}(\text{NO}_3)_2 \rightarrow 2\text{CaO} + 4\text{NO}_2 + \text{O}_2$
- Calculate the volume of nitrogen dioxide obtained at STP?
  - Find the mass of calcium oxide obtained? [Ca=40, N= 14, O=16]
- (iii) State the property exhibited by sulphuric acid when it reacts with following substances. [3]
- Zinc
  - Carbon
  - Sodium Nitrate
- (iv) From the following organic compounds given below choose one compound in each case which relates to the description (a) to (c): [3]  
[Ethane, Ethanol, Acetic Acid, Ethene, Methane]
- A hydrocarbon used to make chloroform.
  - An organic compound whose functional group is carboxyl.
  - A hydrocarbon which on catalytic hydrogenation gives saturated hydrocarbon

### Question 6

- (i) Identify the anion present in the salt on the basis of these reactions. [2]
- Silver nitrate solution is added to a salt solution **X**, a white precipitate insoluble in dilute nitric acid is formed.
  - Addition of dilute hydrochloric acid to salt **Y**, produces a gas which turns lead acetate paper black.

You are provided with a list of chemicals in the box below: [2]  
 Dil. Sulphuric acid, Lead nitrate, Ammonium hydroxide, Dil. Hydrochloric acid, Lead (II)oxide, Sodium chloride, Ammonium chloride

Using suitable chemicals from the list given, write balanced chemical equation for the preparation of the salts mentioned below:

(a) Lead chloride

(b) Ammonium sulphate

(iii) A cylinder contains 68 grams of Ammonia gas at STP: [3]

(a) How many moles of ammonia are present in the cylinder?

(b) What is the volume occupied by this gas?

(c) How many molecules ammonia are present in the cylinder?

(N=14, H=1)

(iv) Identify the reactants **P**, **Q** and **R** in the following reactions. [3]

(a) **P** + Water → Magnesium hydroxide + Ammonia

(b) NaOH + **Q** → Sodium chloride + Ferric hydroxide

(c) Sulphuric Acid + **R** → Oleum

### Question 7 [2]

(i) Give reasons for the following:

(a) Nitric acid obtained in the laboratory is slightly yellowish brown in colour.

(b) During electroplating, a low current for a longer time should be used.

(ii) For each substance listed below, explain its significance in the extraction of aluminium. [2]

(a) Caustic alkali

(b) Powdered Coke

(iii) Give balanced equation for each of the following: [3]

(a) Combustion of ethanol.

(b) Reaction of concentrated nitric acid with copper.

(c) Laboratory preparation of ammonia.

(iv) Anu has tested the pH of solution A, B and C that has pH value 2, 8 and 14 respectively. [3]

(a) Which solution has molecules and ions?

(b) Which solution can evolve sulphur dioxide from calcium sulphite?

(c) Which solution can evolve ammonia from ammonium salts?

### Question 8

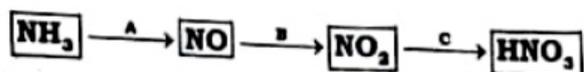
(i) State giving reasons if: [2]

(a) Dil. HCl and dil. HNO<sub>3</sub> can be distinguished using barium chloride solution.

(b) Sulphur dioxide and hydrogen sulphide can be distinguished using lime water.

(ii) Draw an electron dot diagram to show the formation of the ion formed from the compound containing 2 lone pairs of electrons. [2]

(iii) Write the balanced equations for the following conversions (A to C): [3]



(iv) In the periodic table given below, Mg, Si & Ne are placed in the correct positions. The position of other elements is represented by letters. These letters are not the symbols of the elements concerned. Answer the following questions using the alphabets given. [3]

Group Number	1	2	13	14	15	16	17	18
Period 2			D		G	J	M	Ne
Period 3	A	Mg	E	Si		L	R	
Period 4	B	C						

- How many valence electrons are present in L.
- Name the family of elements represented by M and R.
- Name the element represented by G.

\*\*\*\*\*







(  $\text{Fe}^{+2}$ ,  $\text{Cu}^{+2}$ ,  $\text{Fe}^{+3}$  )

- c) Conversion of ethene to ethane is an example of \_\_\_\_\_  
(hydration, hydrogenation, halogenations)
- d) On moving down a group the number of valence electrons \_\_\_\_\_  
( remains same, increases, decreases )
- e) The Cathode used in the electrolytic refining of copper is : \_\_\_\_\_  
(thick impure copper plate /thin pure copper strip , carbon rod)

iv) Match Column - A with Column - B

[5]

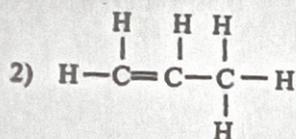
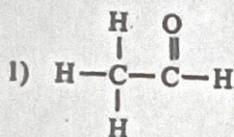
Column - A

Column - B

- |                   |                       |
|-------------------|-----------------------|
| a) Sulphuric Acid | 1. Lithium            |
| b) Alkali metal   | 2. Covalent Compound  |
| c) Methane        | 3. Vanadium Pentoxide |
| d) Halogen        | 4. Acetic Acid        |
| e) Weak acid      | 5. Chlorine           |

v) a) Give the IUPAC name of the following organic compounds:

[5]



b) Draw the structural diagrams for the following compounds.

- 1) 2-Methylpropane
- 2) Ethanoic acid
- 3) Butan-2-ol

**SECTION – B (40 MARKS)**

(Attempt any FOUR questions)

**Question - 3**

- i) Give an significant observation when [2]
- Addition of dilute hydrochloric acid on Iron (II) sulphide.
  - At the anode, when molten lead bromide is electrolyzed using graphite electrode. [2]
- ii) Give reason. [2]
- Covalent compounds have low melting points.
  - Alkali metals are good reducing agents.
- iii) Arrange the following as per the instruction given in the bracket. [3]
- He, Ar, Ne (increasing order of the number of electron shell)
  - Na, Li, K (increasing order of ionisation energy)
  - Mg, Cl, Na, S, Si (decreasing order of atomic size)
- iv) Write balanced chemical equation for the following : [3]
- Action of warm water on Aluminium Nitride.
  - Dilute hydrochloride acid reacts with sodium thiosulphate.
  - Action of Conc. Sulphuric acid on Carbon.

**Question – 4**

- i) Name the main metal present in the following: [2]
- Stainless steel
  - Bronze
- ii) Write balanced chemical equation for the following: [2]
- Laboratory preparation of Ammonia from Ammonium chloride and slaked lime.
  - Action of alcoholic KOH on bromoethane.
- iii) Mention the colour changed observed when the following indicators are added to acids. [3]
- Alkaline Phenolphthalein Solution.
  - Methyl Orange
  - Neutral Litmus Solution
- iv) Compound A is bubbled through bromine dissolved in carbon tetrachloride and the product formed is: [3]



- A  $\xrightarrow{\text{Br}_2 / \text{CCl}_4}$   $\text{CH}_2\text{Br} - \text{CH}_2\text{Br}$
- Draw the Structural Formula of A?
  - What type of reaction 'A' has undergone?
  - What is your observation?

**Question - 5**

- Write balanced equations for the following: [2]
  - Preparation of ethene from ethanol.
  - Action of water on Calcium carbide.
- Name the gas evolved. [2]
  - On pouring dilute Sulphuric acid to Sodium sulphite.
  - On reacting Zinc sulphide with dilute hydrochloric acid.
- With reference to given table answer these questions. [3]

Identify:

Group	1	2	13	14	15	16	17	18
Periods								
2	D		A			O	J	X
3	Y		E			H	M	
4	N	T			P			

- The element that does not form ion.
  - Which element is more reactive than Y?
  - State the number of valence electron in atom J.
- Give reasons for the following. [3]
    - Concentrated NaOH is used to dissolve bauxite in Bayer's process.
    - Sodium Chloride do not conduct electricity in solid state.
    - Platinum electrode is not used in electrolysis of molten lead bromide.

**Question - 6**

- Complete the following by selecting the correct option form the choice given: [2]
  - The metal whose oxide which is amphoteric is reduced to metal by carbon reduction is \_\_\_\_\_. (Fe, Mg, Pb, Al)
  - The divalent metal oxide is reduced to metal by electrolysis of its fused salt is \_\_\_\_\_. (Al, Na, Mg, K)
- Define the following. [2]
  - Isomerism
  - Aquaregia

- iii) An organic compound with vapour density = 94 contains C = 12.67%, H = 2.13% and Br = 85.11%. Find the molecular formula of the organic compound. [3]

[C = 12, H = 1, Br = 80]

- iv) a) What do you understand by lone pair of electrons ?  
b) Draw the electron dot diagram of hydronium ion. [3]

[H = 1, O = 16]

**Question - 7**

- i) For the manufacture of Sulphuric acid by contact process. [2]  
a) Name the solvent used to dissolve sulphur trioxide.  
b) Why is sulphur trioxide not directly dissolved in water?  
ii) State the type of bonding in the following molecules. [2]  
a) Water  
b) Calcium Oxide  
iii) Consider the following reaction and based on the reaction answer the question that follows: [3]



**Calculate**

- a) The quantity in moles of  $(NH_4)_2Cr_2O_7$ , If 63 grams of  $(NH_4)_2Cr_2O_7$  is heated.  
b) The quantity in moles of nitrogen gas produced.  
c) The volume in litres or  $dm^3$  of Nitrogen evolved at the same time.  
[H = 1, Cr = 52, N = 14, O = 16]  
iv) The following table represent the elements and the atomic number. [3]

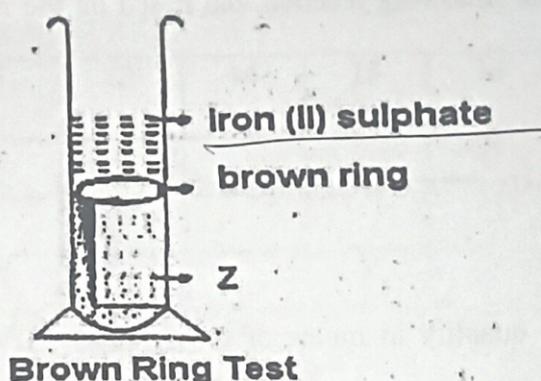
Element	Atomic Number
P	13
Q	7
R	10

With reference to this answer the following using only the alphabets given in the table.

- a) Which element combines with hydrogen to form a basic gas?  
b) Name the element which forms ionic compound with chlorine.  
c) What is the formula of the above compound formed in (b).

## Question - 8

- i) Choose the answers from the list which fits in the description. [2]  
[ PbO , NaCl, CCl<sub>4</sub>, CuO, NH<sub>4</sub>Cl ]
- a) A compound which undergoes thermal dissociation.  
b) A compound which is a non-electrolyte.
- ii) Distinguish between the following pairs of compounds using the test given within the bracket. [2]
- a) Dilute sulphuric acid and Dilute hydrochloric acid  
[Using Barium chloride solution]
- b) Iron (III) chloride and Copper (II) Chloride.  
[Using Ammonium hydroxide solution]
- iii) Study the diagram which shows the Brown Ring Test and answer the following questions given below: [3]



- a) Name the substance 'Z'.  
b) Why is freshly prepared Iron (II) sulphate used in the test.  
c) Which radical is determined by the brown ring test?
- iv) Identify the cation in each of the following case. [3]
- a) NaOH solution when added to the solution (A) gives a reddish brown precipitate.  
b) NH<sub>4</sub>OH solution when added to the solution (B) gives white ppt which does not dissolve in excess.  
c) NaOH solution when added to solution (C) gives white precipitate which is in soluble in excess.

## Question Paper 25

### SECTION A (40 MARKS) ATTEMPT ALL QUESTIONS

#### Question 1

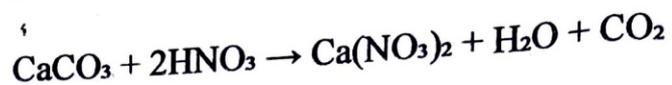
Choose the correct answer to the questions from the options given below  
( Do not copy the questions, write the answers only)

[15]

- Ravi was asked to identify the cation present in the salt solution. He added one of the reagents given below and got a reddish-brown precipitate. The reagent that he used is:
  - Silver nitrate solution
  - Barium chloride solution
  - Ammonium hydroxide
  - Calcium chloride solution
- Prateek added warm water to magnesium nitride, and a colourless gas evolved, which, when tested with phenolphthalein, turned it pink. The gas evolved is:
  - Carbon dioxide
  - Ammonia
  - Nitrogen
  - Hydrogen chloride
- The relative atomic mass of Nitrogen is 14 and that of Hydrogen is 1. This means that (i) \_\_\_\_\_ of Nitrogen and has the mass of (ii) \_\_\_\_\_ of Hydrogen
  - (i) An atom –(ii) 28 molecules
  - (i) An atom –(ii) 7 molecules
  - (i) A molecule –(ii) 14 atoms
  - (i) A molecule –(ii) 7 atomsWhich words completely fill the gaps?
- Which ion has the same electronic configuration as argon?
  - $\text{Ca}^{2+}$
  - $\text{K}^+$
  - $\text{S}^{2-}$
  - All of these
- When a compound was electrolysed using inert electrodes, the gas released at the anode made a glowing splinter rekindle. The electrolyte that will not produce such gas observation at the anode is:

- (a) diluted solution of NaCl.  
(b) concentrated solution of NaCl.  
(c) diluted solution of copper sulphate.  
(d) acidified water
6. The pH of the soil is tested, and for the better growth of crops, slightly alkaline soil is required. Which ion in the fertiliser will increase the alkalinity of the soil?  
(a) Hydronium ion  
(b) Hydroxyl ion  
(c) Hydrogen ion  
(d) Both hydroxyl and hydrogen
7. A student adds **zinc granules to dilute hydrochloric acid**. The gas produced is tested with moist litmus paper.  
What is the gas and the effect on litmus paper?  
Gas | Final colour of litmus paper.  
(a) Hydrogen | No change in red or blue litmus.  
(b) Chlorine | Blue litmus turns red, then bleached.  
(c) Carbon dioxide | Blue litmus turns red  
(d) Oxygen | Red litmus turns blue
8. A distinctive reaction that takes place when ethanol is treated with acetic acid in the presence of concentrated sulphuric acid to give a fruity smell.  
P: The reaction is called esterification.  
Q: The reaction is called hydration.  
(a) Only P  
(b) Only Q  
(c) Both P and Q  
(d) Both P and Q are wrong

9. 12.6 g of nitric acid reacts completely with excess calcium carbonate.



Calculate the volume of  $\text{CO}_2$  formed at RTP.  
(Ca = 40, C = 12, O = 16, N = 14, H = 1)

- (a)  $2.4 \text{ dm}^3$   
(b)  $3.6 \text{ dm}^3$   
(c)  $1.2 \text{ dm}^3$   
(d)  $4.8 \text{ dm}^3$
10. During the extraction of aluminium by Hall Heroult's process, the carbon rods are replaced continuously. This is because:
- (a) It minimises heat loss by radiation.  
(b) It enhances the mobility of ions.  
(c) The carbon anode is consumed.  
(d) It lowers the fusion point.
11. An element **M** belongs to **Group 16** of the periodic table and is a non-metal.  
Its electronic configuration is **2,8,6**.

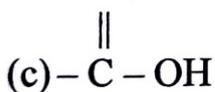
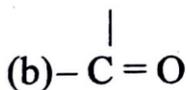
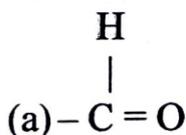
Which of the following best explains its behaviour during ion formation?

- (a) It loses six electrons to form a positive ion.  
(b) It gains two electrons to form a negative ion.  
(c) It shares six electrons to form a noble gas.  
(d) It gains eight electrons to become stable

12. Which of the following statements about ethane is false?

- (a) It is a saturated hydrocarbon.
- (b) It undergoes a substitution reaction.
- (c) It is a gas at ordinary temperatures.
- (d) It has a triple bond between the carbon atom

13. When two organic compounds A and B react together in the presence of conc.  $H_2SO_4$ , a fruity smell evolved from one of the products. If A has the functional group  $[-O-H]$ , which of the following stands for the functional group of B?



14. Identify the wrong order:

- (a)  $F < Cl < Br < I$  (Atomic size)
- (b)  $Mg^{2+} < Al^{3+} < Si^{4+}$  (Ionic size)
- (c)  $N < O < F$  (Electron affinity)
- (d)  $Li < Be < B$  (Ionization energy)

15. Which of the following statements are true for sulphur dioxide gas?

- I. It has a choking smell.
- II. It turns acidified potassium dichromate green
- III. It supports burning.
- IV. It is a reducing agent

- (a) I and II.
- (b) I, II and IV.
- (c) II and III.
- (d) III and IV

### Question 2

(i) (A) A student prepared a Potassium sulphite solution in the lab and added few drops of barium nitrate solution to it. He observed a white precipitate being formed in the test tube. On addition of dilute hydrochloric acid to the white precipitate and mixing it, he observed that the precipitate disappeared. [3]

(a) Name the white precipitate.

(b) Write a balanced chemical equation for the reaction between dilute hydrochloric acid and the white precipitate.

(c) Name the gas evolved in the above reaction.

(B) Answer in one word [2]

(a) Name a positive non-metallic radical which is basic in nature

(b) How many molecules are present in one molecule of  $\text{CH}_4$

(ii) Fill in the blanks by choosing the correct options from the bracket  
An aqueous solution of gas X turns red litmus blue, indicating the presence of [5]

(i) \_\_\_\_\_ ( $\text{H}^+$  /  $\text{OH}^-$ ) ions.

When excess of this solution is added to copper sulphate solution, a

(ii) \_\_\_\_\_ (pale blue / deep blue) solution is formed.

Gas X acts as a

(iii) \_\_\_\_\_ (reducing / oxidising) agent.

In excess, it reacts with chlorine gas to form dense white fumes of

(iv) \_\_\_\_\_ (ammonium chloride / hydrogen chloride).

Gas X is therefore identified as

(v) \_\_\_\_\_ (ammonia / hydrogen chloride).

(iii) Match the Column A with Column B:

[5]

Column A	Column B
(a) $N_2 + 3H_2 \rightleftharpoons 2NH_3$	1. Vanadium Pentoxide
(b) $4NH_3 + 5O_2 \rightleftharpoons 4NO + 6H_2O$	2. Nickel
(c) $2SO_2 + O_2 \rightleftharpoons 2SO_3$	3. Iron
(d) $C_2H_4 + H_2 \rightleftharpoons C_2H_6$	4. Concentrated Sulphuric acid
(e) $CuSO_4 \cdot 5H_2O \rightleftharpoons CuSO_4 + 5H_2O$	5. Platinum

(iv) State the terms for the following:

[5]

(a) A substance which when dissolved in water forms hydronium ion as the only positive ion.

(b) A type of covalent bond in which electrons are shared equally between the combining atoms.

(c) The process by which a base metal is coated with another metal, either to protect the metal or to give it an attractive appearance.

(d) The type of reaction characteristic for alkanes.

(e) The substance which oxidises the other substance and itself gets reduced.

(v) (a) Draw the structural diagram for the following organic compounds:

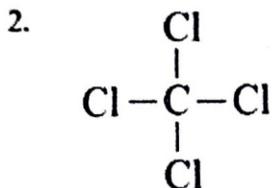
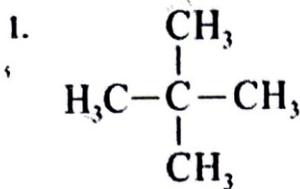
[5]

1. bromoethane .

2. methanol

3. but-2-yne

(b) Give IUPAC name for the following organic compounds:

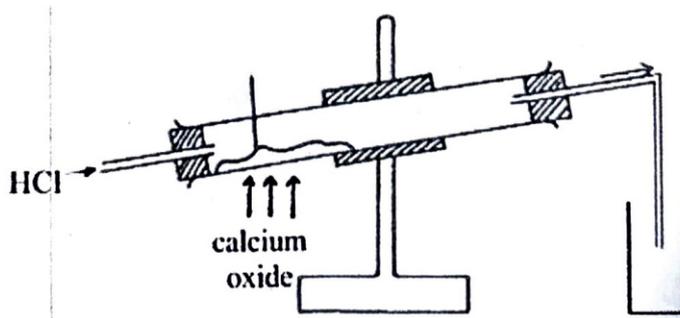


**SECTION B (40 MARKS)**

**ATTEMPT ONLY FOUR QUESTIONS FROM THIS SECTION**

**Question 3**

(i) Calcium oxide is a drying agent which removes water vapour. A student wanted to collect a dry sample of the hydrogen chloride gas produced. The student set up the apparatus as shown below but was unsuccessful in collecting any gas. [2]



(a) What mistake did the student make?

(b) What change should be made by the student in order to collect the dry HCl gas?

(ii) Select the correct answer from the options given in the brackets: [2]

(a) The ion which is discharged at the cathode during the electrolysis of  $\text{CuSO}_4$  solution using copper electrodes. [ $\text{Cu}^{2+}$ ,  $\text{OH}^-$ ,  $\text{SO}_4^{2-}$ ,  $\text{H}^+$ ]

(b) During electroplating of an article with Ag using sodium argentocyanide as an electrolyte, the anode is made of. [Cu, Ag, Pt, Na]

(iii) Ethane  $\text{C}_2\text{H}_6$  burns in oxygen to produce carbon dioxide and water as shown in the equation given below: [3]



Calculate the composition of the resulting gaseous mixture at room temperature when 60 c.c. of ethane burns in 250 c.c. of oxygen.

(iv) Match the uses of alloys in List 1 with the appropriate answer from List 2. [3]

List 1	List 2
(a) Used in making decorative articles.	1. Stainless steel
(b) An alloy used in making aircraft and light tools.	2. Brass
(c) Used in making surgical Instruments.	3. Duralumin

#### Question 4

(i) You are provided with some compounds in the box. [3]

$\text{SO}_2$ , $\text{PbO}$ , $\text{CO}$ , $\text{K}_2\text{SO}_4$ , $\text{H}_2\text{SO}_4$ , $\text{CH}_3\text{COOH}$ , $\text{NaHSO}_4$ , $\text{KCl}$
--

Choose the compound from the above box that fits the descriptions from (a) to (c).

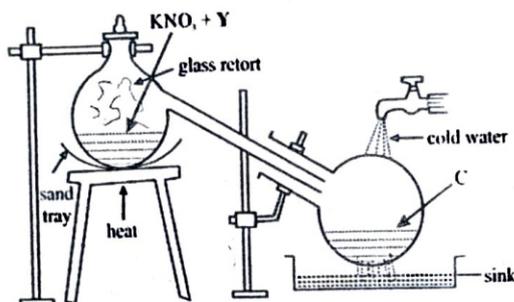
- (a) An acid present in vinegar.
- (b) An oxide which dissolves in water forming an acid.
- (c) A salt formed by the incomplete neutralization of an acid by a base.

(ii) Draw the dot and cross structure of the following: [3]

- (a) Hydronium ion
- (b) Oxygen molecule
- (c) Calcium oxide

[Atomic number: H = 1, O = 8, Ca = 20]

(iii) Given below is the diagram for the laboratory preparation of Nitric Acid. [4]



(a) Name the reactant labelled Y.

(b) Write a balanced equation for the reaction between Y and  $\text{KNO}_3$ .

(c) The complete apparatus is made up of glass. Why?

(d) State why concentrated  $\text{HNO}_3$  appears slightly yellowish in colour when left standing in a glass bottle for a long time.

### Question 5

(i) Choose the letters L, M, N, O & P to match the description (a) to (c) given below: [3]

[L – Ammonia, M – Nitrogen, N – Hydrogen sulphide  
O – Hydrogenchloride gas, P – Nitrogen dioxide]

(a) When this gas comes in contact with ammonia dense white fumes are seen.

(b) The gas that turns moist lead acetate paper silvery black.

(c) The gas produced on heating lead nitrate.

(ii) Smith wrote the following statements incorrectly. Insert a word to correct the statements. [3]

- (a) Lead bromide conducts electricity.
- (b) Copper reacts with nitric acid to form nitrogen dioxide gas.
- (c) Bromoethane reacts with sodium hydroxide to produce ethanol and sodium bromide.

(iii) Match the Column A (showing the properties of  $H_2SO_4$ ) with Column B (showing the reaction of  $H_2SO_4$ ) [4]

Column A Properties of $H_2SO_4$	Column B Reaction of $H_2SO_4$
(a) Acidic property	1. $C_{12}H_{22}O_{11} + nH_2SO_4 \rightarrow 12C + 11H_2O + nH_2SO_4$
(b) Dehydrating property	2. $S + 2H_2SO_4 \rightarrow 3SO_2 + 2H_2O$
(c) <del>Non-volatile acid</del> <i>Exothermic property</i>	3. $CaO + H_2SO_4 \rightarrow CaSO_4 + H_2O$

### Question 6

(i) Name the main metal present in the following alloys: [2]

(a) Duralumin

(b) Brass

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

(a) Laboratory preparation of hydrochloric acid from a less volatile acid.

(b) Bromine gas is passed over ethene in the presence of carbon tetrachloride.

(iii) Akash was given a salt 'X' for analysis which was white in colour. On strong heating it produced a yellow residue, a colourless gas, and also a reddish-brown gas. The solution of the salt 'X' when tested with excess of ammonium hydroxide produced a chalky white insoluble precipitate. [3]

(a) Name the coloured gas evolved when Akash heated the salt strongly.

- (b) Which cation was present in the sample given to Akash?  
(c) Identify the salt given to Akash for analysis.

(iv) In a round bottom flask, a mixture of ethanol, acetic acid and concentrated sulphuric acid was heated: [3]

- (a) Name the type of reaction occurring in the above set up.  
(b) What is the role of sulphuric acid in this reaction?  
(c) State one observation that takes place during the reaction.

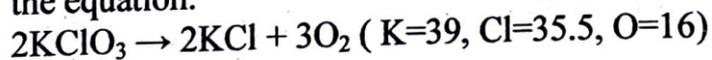
### Question 7

- (i) The atomic numbers of two elements P and Q are 11 and 16 respectively. [2]

State:

- (a) the valency of P.  
(b) the formula of the compound formed between P and Q.  
(Do not identify the elements)

- (ii) Ravi heated 367.5 g of  $\text{KClO}_3$  in a test tube. The decomposition of potassium chlorate took place according to the equation. [2]



Find:

- (a) the volume of the colourless and odourless gas liberated during the experiment.  
(b) the weight of the residue left behind in the test tube.

- (iii) Write complete and balanced equations for the reactions occurring in the following cases: [3]

(a) Passing dry ammonia gas over heated lead oxide placed in a combustion tube to produce a silvery grey metal.

(b) When concentrated nitric acid is reacted with zinc to produce a reddish-brown gas.

(c) When concentrated sulphuric acid oxidises sulphur to produce a gas which turns acidified potassium dichromate paper green.

- (iv) Nitrogen and hydrogen combine in the presence of a catalyst to give ammonia gas. With reference to the above reaction: [3]
- (a) Name the catalyst used.
  - (b) At what temperature does the above reaction occur?
  - (c) What optimum pressure should be maintained during the reaction?

### Question 8

- (i) Seema added a few pieces of copper turnings to a test tube containing concentrated acid P and she noticed that a reddish-brown gas evolved. [2]
- (a) Name the acid P used by Seema.
  - (b) Write a balanced chemical equation for the reaction that took place.
- (ii) Answer the following questions with reference to the concentration of bauxite ore. [2]
- (a) Name the process used to concentrate the ore.
  - (b) Give a balanced chemical equation for the conversion of aluminium hydroxide to pure alumina
- (iii) Draw the dot and cross structure of the following: [3]
- (a) An ionic compound formed when Mg reacts with the dilute HCl.
  - (b) A covalent compound formed when  $H_2$  reacts with  $Cl_2$ .
  - (c) The positive ion produced when ammonia gas is dissolved in water.

[Atomic number: Mg = 12, Cl = 17, H = 1, N = 7]

- (iv) P, Q, R and S are the different methods of preparation of salts. [3]
- P – Simple displacement
  - Q – Neutralisation by titration
  - R – Precipitation
  - S – Direct combination

Choose the most appropriate method to prepare the following salts:

- (a)  $PbCl_2$
- (b)  $FeCl_3$
- (c)  $Na_2SO_4$

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