

SpellIndia

INDIA's **1**  
No.

**SPELLING BEE**

Preparatory Study Material  
Provider

[www.phonicsestore.com](http://www.phonicsestore.com)

**ICSE ACADEMY**  
[www.spellbeeacademy.com](http://www.spellbeeacademy.com)



**PREPARE**

for

**ICSE**

Class 10

**CHEMISTRY**

Questions ONLY

A Collection  
of Questions  
from Prelim  
exam papers of  
various  
ICSE schools



# ICSE ACADEMY: How to Prepare for ICSE Class 10 exams

<https://www.spellbeeacademy.com/icse.html>



## How to Prepare for ICSE Class 10 exams : Free Resources

Please click on subject to proceed further.

We will keep adding resources here till "March 2026".

So, save this link, keep visiting and stay updated.

( Resources include : Syllabus, Past Year Papers, Specimen Papers, Competency based Questions, Books pdf downloadable, 350+ Term Papers / Prelim Papers of various schools - across subjects, etc. )

- 01 English Literature
- 02 English Language
- 03 Geography
- 04 History & Civics
- 05 Physics
- 06 Chemistry
- 07 Mathematics
- 08 Biology
- 09 Computer Applications
- 10 Physical Education
- 11 Hindi
- 12 Commercial Studies
- 13 Economics
- 14 Technical Drawing
- 15 Environmental Science
- 16 Home Science
- 17 Gujarati
- 18 Marathi
- 19 French

SCAN QR code to buy the book at amazon NOW.

SpellIndia  
INDIA's No. 1 SPELLING BEE  
Preparatory Study Material Provider  
www.spellindia.com

ICSE ACADEMY  
www.spellbeeacademy.com

**Pati's**

**PREPARE**  
for  
**ICSE**  
Classes 9 & 10  
**ENGLISH GRAMMAR**  
(includes Board Specimen Papers of 5 years & Competency-focused questions)

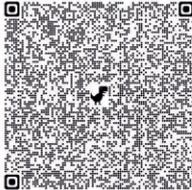
**28 YEARS** Past Questions

**75 Practice TESTS**

According to latest ICSE syllabus  
**2024-2027 exams**

**Debashis Pati**  
Author is the 1st individual to write preparatory books on various topics of "multiple" Spelling Bee competitions in India. He has written the Maximum Number of Spelling Books as well as Tests in the world.

Spelling / Vocabulary / Grammar Olympiad Exam conductor.



SpellIndia  
INDIA's No. 1 SPELLING BEE  
Preparatory Study Material Provider  
www.spellindia.com

ICSE ACADEMY  
www.spellbeeacademy.com

**Pati's**

**PREPARE**  
for  
**ICSE**  
Class 10  
(Acts 3 to 5 only)  
**Julius Caesar**

**1000+ Practice QUESTIONS\***

**30 Practice TESTS**  
(Prelim exam questions of 30 schools)

# Past Years' Questions (13 years: 1990 onwards)  
# Competency focused Questions (1 year)  
# Multiple choice Questions (850+ nos\*)  
# Extract based Questions (65+ extracts\*)  
\* excludes the questions in the 13 past years' questions and the 30 Tests.

According to latest ICSE syllabus  
**2024-2027 exams**

**Debashis Pati**  
Author is the 1st individual to write preparatory books on various topics of "multiple" Spelling Bee competitions in India. He has written the Maximum Number of Spelling Books as well as Tests in the world.

Spelling / Vocabulary / Grammar Olympiad Exam conductor.



SpellIndia  
INDIA's No. 1 SPELLING BEE  
Preparatory Study Material Provider  
www.spellindia.com

ICSE ACADEMY  
www.spellbeeacademy.com

**Pati's**

**PREPARE**  
for  
**ICSE**  
Class 10  
**HINDI GRAMMAR**

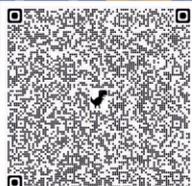
**350+ SAMPLE QUESTIONS**

**51 TEST PAPERS**

# 350+ Sample practice questions & # 51 Tests

According to latest ICSE syllabus  
**2025 / 2026 onwards**

**तामसी पति**  
**Tamasee Pati**



SpellIndia  
INDIA's No. 1 SPELLING BEE  
Preparatory Study Material Provider  
www.spellindia.com

ICSE ACADEMY  
www.spellbeeacademy.com

**Pati's**

**PREPARE**  
for  
**ICSE**  
Class 10  
**CIVICS**

**40 TEST PAPERS**

*The TESTS are based on the Prelim / Pre-board papers of various schools. Answers are provided for all.*  
Competency Based Questions and 3 Specimen Papers are provided.

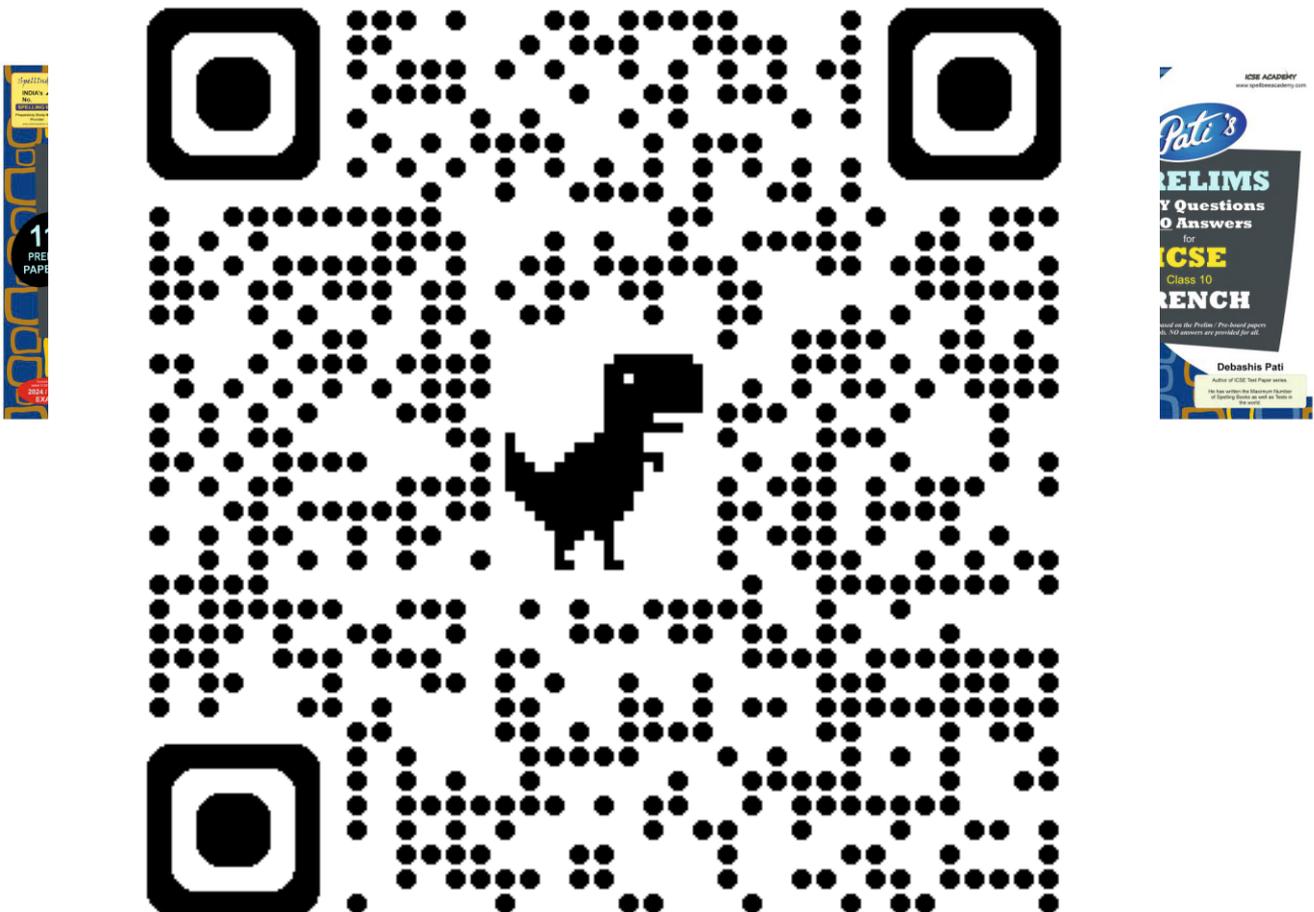
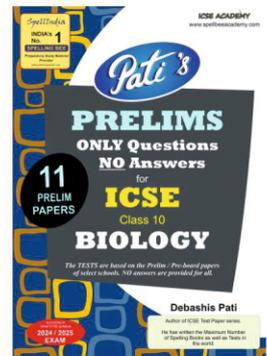
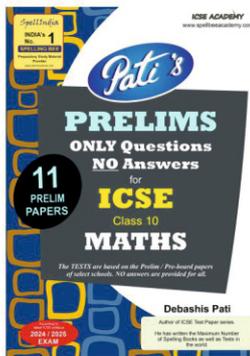
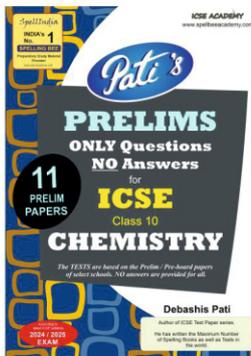
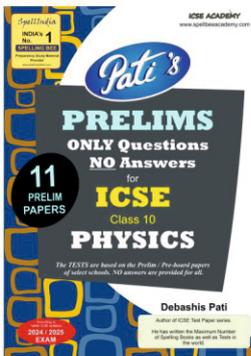
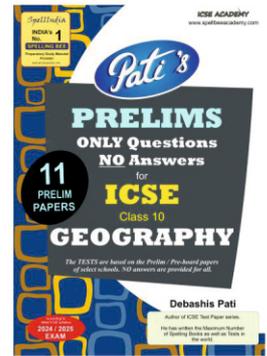
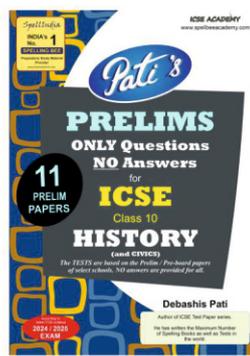
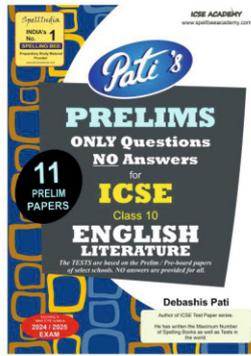
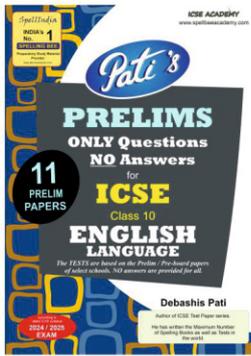
According to latest ICSE syllabus  
**2024 / 2025 EXAM**

**Debashis Pati**  
Author of ICSE Test Paper series.

He has written the Maximum Number of Spelling Books as well as Tests in the world.



# Scan QR code for Free Access to 500+ Prelim Papers across 20 subjects





**ICSE ACADEMY**

## **Set 3a : Question Papers**

(In this flipbook)

1. KISA - Karnataka ICSE Schools Association
2. Dhirubhai Ambani, Mumbai
3. Sulochanadevi, Thane
4. Jamnabai Narsee, Mumbai
5. Hiranandani Foundation, Powai, Mumbai
6. S S Ravishankar Vidyamandir, Mumbai
7. Pawar Public, Bhandup, Mumbai
8. J B Vachcha, Mumbai
9. Vidya Pratisthan, Pune
10. Vissanji, Mumbai

2025-2026 - Prelim 2



**ICSE ACADEMY**

## **Set 3b : Question Papers**

(Not in this flipbook, but in the next one -3b)

11. Lokhandwala Foundation, Mumbai
12. J B Petit Girls, Mumbai
13. Gokuldham, Mumbai
14. G S Shetty, Mumbai
15. Cathedral & John Connon, Mumbai
16. Christ Church, Mumbai
17. St Mary's, Mumbai
18. St Peter's, Mumbai
19. Euro, Mumbai
20. Greenlawns, Mumbai

2025-2026 - Prelim 2



**ICSE ACADEMY**

## **Set 3c : Question Papers**

(Not in this flipbook, but in the next one -3b)

21. St Gregorios, Mumbai
22. Hiranandani Foundation, Thane
23. Universal, Mumbai
24. Unknown - 1



**KARNATAKA ICSE SCHOOLS ASSOCIATION**  
**ICSE STD. X Preparatory Examination 2026**

Subject – CHEMISTRY (SCIENCE PAPER – 2)

Duration: 2 Hr.

Maximum Marks: 80

Date: 09.01.2026

**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.
3. This time is to be spent in reading the Question Paper.
4. **The time given at the head of this Paper is the time allotted for writing the answers.**
5. **Section A is compulsory** attempt **any four** questions from **Section B**.
6. 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.

[15]

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

(i) Which of the following pairs are non-polar covalent compounds?

- |                      |                         |
|----------------------|-------------------------|
| 1. Hydrogen chloride | 2. Carbon tetrachloride |
| 3. Sodium chloride   | 4. Methane              |

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

(ii) Which of the following are the raw materials for the preparation of a fruit smelling compound in the presence a non-volatile strong acid?

- |                |            |
|----------------|------------|
| 1. Acetic acid | 2. Ethane  |
| 3. Ethanol     | 4. Ethanal |

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

(iii) **Assertion (A)** Aluminium is extracted by electrolytic reduction method.

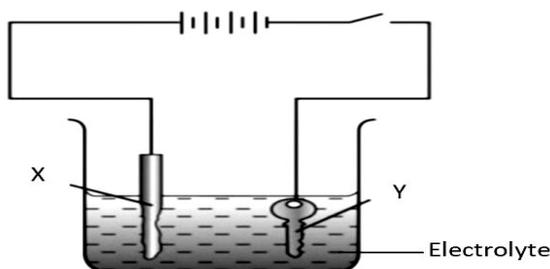
**Reason (R)** Aluminium is amphoteric in nature.

- (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) Identify the correct ionization equation for a divalent metal 'M'.

- (a)  $M + 1e \longrightarrow M^{1+}$
- (b)  $M - 2e \longrightarrow M^{2+}$
- (c)  $M + 2e \longrightarrow M^{2+}$
- (d)  $M - 2e \longrightarrow M^{2-}$

(v) A student Raghava wanted to electroplate locker key with gold. So he arranged the setup as shown in the below figure. Which of the following holds good for the same?



- (a) **Electrolyte**: Gold solution, **X** - Cathode: Impure gold metal rod, **Y** - Anode: Key
- (b) **Electrolyte**: Gold solution, **Y** - Cathode: Key, **X** - Anode: Pure gold metal rod
- (c) **Electrolyte**: Gold solution, **X** - Cathode: Key, **Y** - Anode: Impure gold metal rod
- (d) **Electrolyte**: Gold solution, **Y** - Cathode: Pure gold metal rod, **Y** - Anode: Key

(vi) The correct arrangement of elements with their no. of electron shells is:

- (a) He < C < Al < Ca
- (b) Ca < C < Si < P

(c)  $\text{Na} > \text{F} > \text{Si} < \text{K}$

(d)  $\text{H} < \text{Na} < \text{Li} < \text{N}$

(vii) Which of the following is correct in the electron dot diagram of acetate ion?

	C-H Bond	C-C Bond	C-O Single Bond	C-O Double Bond	Charge on acetate ion
(a)	3	1	1	1	+
(b)	3	2	2	1	+
(c)	2	1	1	2	-
(d)	3	1	1	1	-

(viii) The metal oxide which produces salt and water with acid as well as alkali is:

(a)  $\text{K}_2\text{O}$

(b)  $\text{Al}_2\text{O}_3$

(c)  $\text{Na}_2\text{O}$

(d)  $\text{Ca}_2\text{O}$

(ix) Which of the following pairs have the same empirical formula?

1. Methanol

2. Glucose

3. Acetic acid

4. Benzene

(a) 1 and 3

(b) 2 and 3

(c) 1 and 4

(d) 3 and 4

(x) Which of the following metal nitrate produces reddish brown coloured gas upon heating?

(a) Lead nitrate

(b) Potassium nitrate

(c) Sodium nitrate

(d) None of these

- (xi) Which of the following method is used in the concentration of bauxite ore?
- (a) Gravity Separation
  - (b) Froth Floatation
  - (c) Leaching
  - (d) Magnetic Separation
- (xii) The number of covalent bonds present in ammonium chloride is:
- (a) 3
  - (b) 4
  - (c) 5
  - (d) 2
- (xiii) The ion which do not form precipitate with weak alkali is:
- (a) Ferric ion
  - (b) Cuprous ion
  - (c) Calcium ion
  - (d) Ferrous ion
- (xiv) What property of dilute sulphuric acid can be demonstrated by treating it with ammonium carbonate salt to obtain carbon dioxide gas?
- (a) Oxidising property
  - (b) Acidic property
  - (c) Drying property
  - (d) Dehydrating property
- (xv) Dry ammonia gas does not change the red litmus to blue. Which of the following statements are true for this statement?

1. Ammonia gas is acidic in nature.
2. Ammonia gas does not ionise in gaseous state.
3. Ammonia gas is basic in nature.
4. Ammonia gas does not ionise in the absence of water.

- (a) Statements 1 and 2
- (b) Statements 1 and 4
- (c) Statements 3 and 2
- (d) Statements 3 and 4

### Question 2

- (i) Read the passage below and answer the questions that follows: [5]

Raman treated the crushed egg shells with dilute hydrochloric acid in a test tube. The effervescence was seen, when this gas was passed through freshly prepared lime water, it turned lime water milky and when passed over acidified potassium permanganate, no change in the colour was observed.

- (a) Name the gas obtained by Raman.
- (b) Name the type of bonding present in the gas molecule.
- (c) Write the electron dot structure for this molecule.
- (d) Write the chemical equation for the dissolution of this gas in water.
- (e) What is the nature of the solution formed in question (d)?

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

- (a) The bulb glows when connected across the electrolytic cell. This is due to movement of \_\_\_\_\_ (ions/electrons/molecules) in the electrolyte.
- (b) The \_\_\_\_\_ (blue/yellow/green) flame was formed when methane gas was burnt in the limited supply of oxygen.
- (c) The acid which turns sugar to sugar charcoal is \_\_\_\_\_. (Dil. Sulphuric acid/Con. Hydrochloride acid/Con. Sulphuric acid)
- (d) The electron affinity across the period \_\_\_\_\_ (increases/decreases/remains same) in the periodic table.
- (e) The no. of non-ionisable hydrogen atoms present in a molecule of acetic acid are \_\_\_\_\_. (4/3/2)

(iii) Answer the following questions based on the part of the periodic table given below: [5]

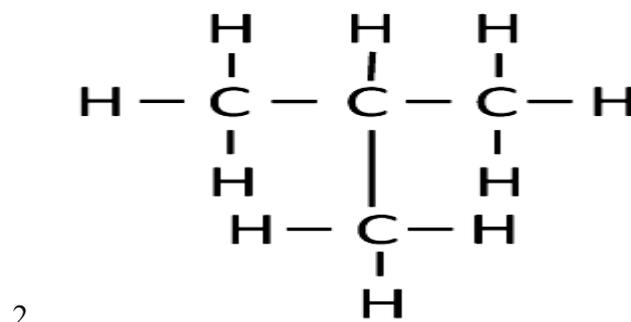
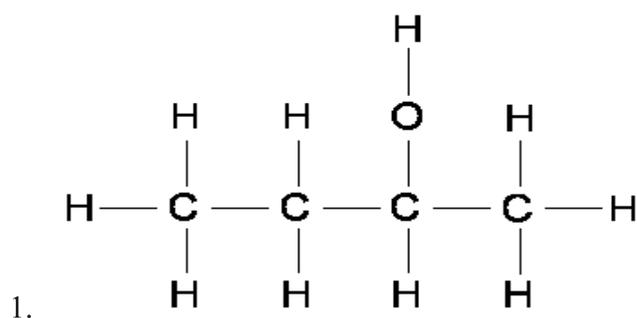
Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 0
A		E				J	Ne
B	Mg	F	Si		I	K	L
C	D		G	H			M

- Identify the elements J and K
- Which is the most reducing element?
- Write the ionisation equation of the element 'E'.
- Name the element which has valency -2.
- Which element has the least atomic size?

(iv) Match the **Column A** with **Column B** [5]

Column A	Column B
(a) Cinnabar	1. Drying agent
(b) Calcium chloride	2. Calcination
(c) Carbonate ores	3. Palladium
(d) Hydrogenation	4. Dehydrating agent
(e) Con. Sulphuric acid	5. Froth flotation

(v) (a) Give the IUPAC name of the following organic compounds: [2]



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

[3]

1. 2 methyl propanoic acid
2. 3 pentanol
3. 1,2 dichloro ethane

**SECTION B (40 Marks)**  
(Attempt any four questions from this Section).

**Question 8**

(i) Sowmya of class 10th was checking the nature of the given samples by using litmus and other indicators. The samples and results are recorded below in the table. Answer the questions that follow. [4]

Sample	Result
A	Colourless phenolphthalein changes to pink
B	Blue litmus changes to red
C	No effect on litmus papers (both wet and dry)
D	Methyl orange remains orange

- (a) Which sample can be used to produce hydrogen sulphide gas from calcium sulphide?
- (b) Which sample may be non electrolyte?
- (c) Which sample may have pH equal to 7?
- (d) Which sample may have pH less than 7?

(ii) Identify the following:

[3]

- (a) The half of the inter-nuclei distance in a diatomic molecule.
- (b) The ability of an atom to join with same type atoms to form the longest chain.
- (c) The volume occupied by one mole of any gas at STP.

(iii) Write the balanced equations for the following conversions. [3]

(a) Ammonia from ammonium sulphate.

(b) Iron[II] chloride from Iron.

(c) Silver chloride from silver nitrate.

#### Question 4

(i) Calculate the empirical formula and molecular formula of an organic compound with molecular mass 180 g and having the following percentage composition. [4]

Composition: 6.67% hydrogen, 53.33% oxygen and the rest is being carbon. [C-12, H-1 & O-16]

(ii) State one relevant observation for the following. [3]

(a) Dry sulphur dioxide gas passed through acidified potassium permanganate solution.

(b) Zinc oxide is heated.

(c) Excess chlorine gas is passed over wet blue litmus paper.

(iii) Rewrite the following statements using missing word/s: [3]

(a) Ethyl alcohol is a hydrocarbon.

(b) Sulphuric acid is a good dehydrating agent.

(c) HCl gas does not turn dry blue litmus to red.

#### Question 5

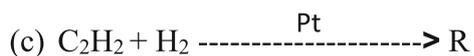
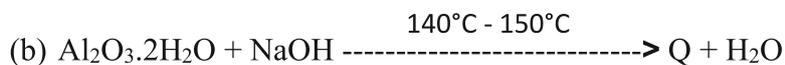
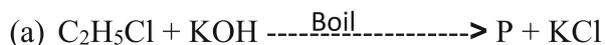
(i) Draw the electron dot diagram for the following. [3]

(a) A positive ion formed when ammonia gas is converted into ammonia solution.

(b) A product obtained when calcium is burnt directly in the atmospheric oxygen.

(c) An inert gas present in the atmospheric air in large quantity.

(ii) Identify the products P, Q and R in the following. [3]

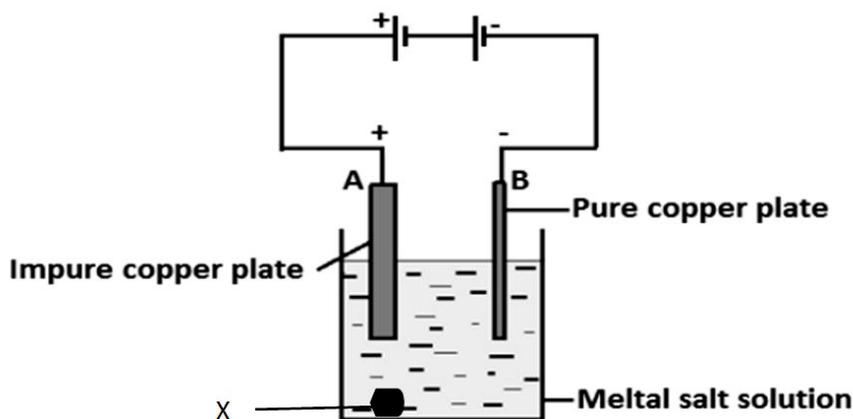


(iii) Answer the following questions that are related to Hall-Heroult's process [electrolytic reduction of alumina] [4]

- Write the reaction that takes place at cathode.
- Why is the electrolytic cell made with a sloping bottom?
- What is the role of coke powder sprinkled over the electrolyte?
- Name the 2 constituents of electrolytic mixture other than alumina.

### Question 6

(i) One of the applications of electrolysis is shown in the below diagram. Answer the following questions with respect to the diagram. [4]



- Identify the cation present in the electrolyte.
- Write the reaction that takes place at anode.
- Identify the process shown in the above diagram.
- Name 'X'

(ii) Identify the best option from the given box for the following. [4]

Lead nitrate, Sulphuric acid, Benzene, Ferric chloride, Ferrous chloride, Sugar, Nitric acid

- (a) A binary salt prepared by synthesis method.
- (b) A substance on hydrolysis gives any positive ion other than hydrogen ion and any negative ion other than hydroxyl ion.
- (c) A liquid which produces reddish brown coloured gas on thermal decomposition.
- (d) A substance which cannot be used as a drying agent in the preparation of ammonia gas.

(iii) Give reason for the following. [2]

- (a) Solid sodium chloride does not conduct electricity.
- (b) Alumina cannot be reduced by carbon.

### Question 7

(i) Identify the gas liberated in the given following tests. [4]

- (a) Strong heating of lead nitrate salt.
- (b) Carbon is dropped in the concentrated sulphuric acid.
- (c) Ammonia gas is passed over heated copper oxide.
- (d) Water is sprinkled over calcium carbide.

(ii) State the property exhibited by the corresponding acid in the given following tests. [4]

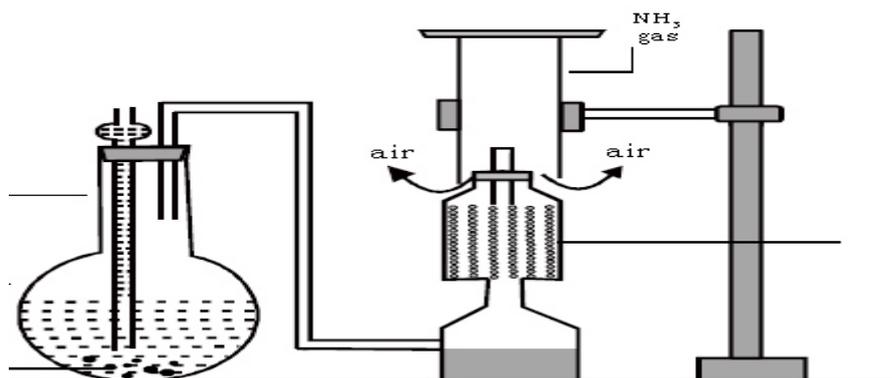
- (a)  $H_2SO_4$  is used in the preparation of HCl gas.
- (b) HCl acid is used to obtain  $SO_2$  gas from metal sulphite salts.
- (c) On treating carbon with con. nitric acid to get  $CO_2$ .
- (d) On treating sugar with con. sulphuric acid to get sugar charcoal.

(iii) Identify the main metal present in the following ores. [2]

- (a) Haematite
- (b) Calamine

- (i) Ananya was preparing ammonia gas in the laboratory as per the given below setup. Answer the following questions by selecting suitable substance/s from the given list. [4]

Con. Sulphuric acid, Water, Calcium nitrate, Ammonium hydroxide, Magnesium nitride, Lumps of calcium oxide, Con. Nitric acid, Hydrochloric acid

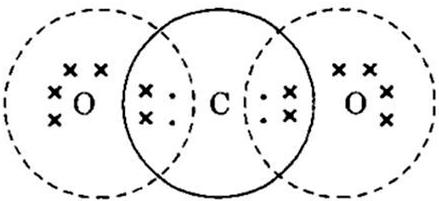


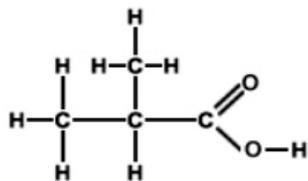
- (a) Identify the reactants that she can use for the preparation of ammonia.  
 (b) Write the balanced equation for the above preparation of ammonia.  
 (c) Name the drying agent.  
 (d) Which substance can be used to test whether the gas jar is filled or not?
- (ii)
- (a) Calculate the volume of oxygen gas required to burn completely 30.0 ml of ethane and also calculate the volume of carbon dioxide formed. [C-12, H-1 & O-16] [2]
- (b) Calculate the total volume of gaseous mixture formed at STP when 165.5 g of lead nitrate is heated. [2]
- $$\text{Pb}(\text{NO}_3)_2 \text{ -----} \rightarrow \text{PbO} + \text{NO}_2 + \text{O}_2 \quad [\text{Pb-207, N-14, O-16}]$$
- (iii) Copy and complete the following table. [2]

Chemical Equation	Name of the process	Identify A. Oxidised substance B. Reduced product
$\text{NH}_3 + \text{O}_2 \text{ -----Pt-----} \rightarrow \text{NO} + \text{H}_2\text{O}$		A. _____ B. _____

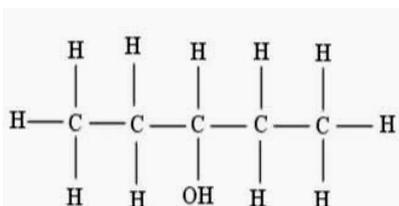


**KARNATAKA ICSE SCHOOLS ASSOCIATION**  
**ICSE STD. X Preparatory Examination 2026**  
**MARKING SCHEME – CHEMISTRY (SCIENCE PAPER 2)**

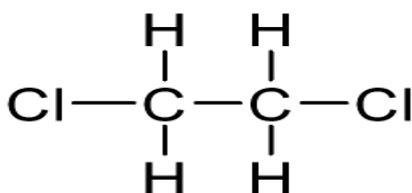
<b>Question 1</b>		[15 X 1]												
(i)	(b) 2 and 4													
(ii)	(a) 1 and 3													
(iii)	(d) Both (A) and (R) are true, but (R) is not the correct explanation of (A).													
(iv)	(b) $M - 2e \longrightarrow M^{2+}$													
(v)	(b) <b>Electrolyte</b> Gold solution, <b>Y</b> - Cathode: Key, <b>X</b> - Anode: Pure gold metal rod													
(vi)	(a) $He < C < Al < Ca$													
(vii)	(d) 3 1 1 1 -													
(viii)	(b) $Al_2O_3$													
(ix)	(b) 2 and 3													
(x)	(a) Lead nitrate													
(xi)	(c) Leaching													
(xii)	(a) 3													
(xiii)	(c) Calcium ion													
(xiv)	(b) Acidic property													
(xv)	(d) Statements 3 and 4													
<b>Question 2</b>														
(i)	(a) $CO_2$ (b) Covalent  (c) <b>Carbon dioxide</b> (d) $CO_2 + H_2O \longrightarrow H_2CO_3$ (e) Acidic	[5 X 1]												
(ii)	(a) Ions (b) Yellow (c) Con. Sulphuric acid (d) Increases (e) 3	[5 X 1]												
(iii)	(a) J – Fluorine & K – Chlorine (b) C (c) $E - 3e \longrightarrow E^{3+}$ (d) I (e) A	[5 X 1]												
(iv)	<table style="width: 100%; border: none;"> <thead> <tr> <th style="text-align: left; width: 50%;"><b>Column A</b></th> <th style="text-align: left; width: 50%;"><b>Column B (Correct answer)</b></th> </tr> </thead> <tbody> <tr> <td>(a) Cinnabar</td> <td>Froth flotation</td> </tr> <tr> <td>(b) Calcium chloride</td> <td>Drying agent</td> </tr> <tr> <td>(c) Carbonate ores</td> <td>Calcination</td> </tr> <tr> <td>(d) Hydrogenation</td> <td>Palladium</td> </tr> <tr> <td>(e) Con. Sulphuric acid</td> <td>Dehydrating agent</td> </tr> </tbody> </table>	<b>Column A</b>	<b>Column B (Correct answer)</b>	(a) Cinnabar	Froth flotation	(b) Calcium chloride	Drying agent	(c) Carbonate ores	Calcination	(d) Hydrogenation	Palladium	(e) Con. Sulphuric acid	Dehydrating agent	[5 X 1]
<b>Column A</b>	<b>Column B (Correct answer)</b>													
(a) Cinnabar	Froth flotation													
(b) Calcium chloride	Drying agent													
(c) Carbonate ores	Calcination													
(d) Hydrogenation	Palladium													
(e) Con. Sulphuric acid	Dehydrating agent													
(v)	(a) 1. 2 Butanol 2. 2 methyl propane	[2+3]												



(b) 1.



2.



3.

### Question 3

- |       |  |     |
|-------|--|-----|
| (i)   | (a) B<br>(b) C<br>(c) D<br>(d) B   | [4] |
| (ii)  | (a) Atomic size/radius<br>(b) Catenation<br>(c) Molar volume   | [3] |
| (iii) | (a) $(\text{NH}_4)_2\text{SO}_4 + \text{Ca}(\text{OH})_2 \longrightarrow \text{CaSO}_4 + 2\text{H}_2\text{O} + 2\text{NH}_3$<br>(b) $2\text{Fe} + 2\text{HCl} \longrightarrow \text{FeCl}_2 + \text{H}_2$<br>(c) $\text{AgNO}_3 + \text{HCl} \longrightarrow \text{AgCl} + \text{HNO}_3$ | [3] |

### Question 4

- | (i)     | <table border="1"> <thead> <tr> <th>Element</th> <th>%</th> <th>At. Mass</th> <th>Atomic Ratio</th> <th>Simple Ratio</th> </tr> </thead> <tbody> <tr> <td>C</td> <td>40</td> <td>12</td> <td>40/12=3.33</td> <td>3.33/3.33=1</td> </tr> <tr> <td>H</td> <td>6.67</td> <td>1</td> <td>6.67/1=6.67</td> <td>6.67/3.33=2</td> </tr> <tr> <td>O</td> <td>53.33</td> <td>16</td> <td>53.33/16=3.33</td> <td>3.33/3.33=1</td> </tr> </tbody> </table> <p><b>EF=C<sub>1</sub>H<sub>2</sub>O<sub>1</sub>.</b></p> <p>EFM=1X12+2X1+1X16=12+2+16=30 g<br/> MM=180 g<br/> N=MM/EFM=180/30=6<br/> MF=(EF)n<br/> MF=(CH<sub>2</sub>O)<sub>6</sub><br/> <b>MF=C<sub>6</sub>H<sub>12</sub>O<sub>6</sub></b></p> | Element  | %             | At. Mass     | Atomic Ratio | Simple Ratio | C | 40 | 12 | 40/12=3.33 | 3.33/3.33=1 | H | 6.67 | 1 | 6.67/1=6.67 | 6.67/3.33=2 | O | 53.33 | 16 | 53.33/16=3.33 | 3.33/3.33=1 | [4] |
|---------|--|----------|---------------|--------------|--------------|--------------|---|----|----|------------|-------------|---|------|---|-------------|-------------|---|-------|----|---------------|-------------|-----|
| Element | %  | At. Mass | Atomic Ratio  | Simple Ratio |              |              |   |    |    |            |             |   |      |   |             |             |   |       |    |               |             |     |
| C       | 40   | 12       | 40/12=3.33    | 3.33/3.33=1  |              |              |   |    |    |            |             |   |      |   |             |             |   |       |    |               |             |     |
| H       | 6.67   | 1        | 6.67/1=6.67   | 6.67/3.33=2  |              |              |   |    |    |            |             |   |      |   |             |             |   |       |    |               |             |     |
| O       | 53.33  | 16       | 53.33/16=3.33 | 3.33/3.33=1  |              |              |   |    |    |            |             |   |      |   |             |             |   |       |    |               |             |     |
| (ii)    | (a) Pink colour of potassium permanganate changes to clear colourless.<br>(b) White to yellow.<br>(c) Blue litmus changes to red.  | [3]      |               |              |              |              |   |    |    |            |             |   |      |   |             |             |   |       |    |               |             |     |
| (iii)   | (a) Ethyl alcohol is an derivative hydrocarbon.<br>(b) Con. Sulphuric acid is a good dehydrating agent.<br>(c) Dry HCl gas does not turn blue litmus to red.   | [3]      |               |              |              |              |   |    |    |            |             |   |      |   |             |             |   |       |    |               |             |     |

### Question 5

(i)	$\left[ \begin{array}{c} \text{H} - \ddot{\text{O}} - \text{H} \\   \\ \text{H} \end{array} \right]^+$ <p>(a) Hydronium ion</p> $\dot{\text{Ca}} + \ddot{\text{O}}: \longrightarrow \text{Ca}^{2+} \left[ \ddot{\text{O}}: \right]^{2-} \longrightarrow \text{CaO}$ <p>(b)</p> $:\text{N}:::\text{N}:$ <p>(c)</p>	[3]
(ii)	(a) C <sub>2</sub> H <sub>5</sub> OH (b) NaAlO <sub>2</sub> (c) C <sub>2</sub> H <sub>4</sub>	[3]
(iii)	(a) Al <sup>3+</sup> + 3e -----> Al (b) To facilitate the movement of molten aluminium. (c) To prevent / reduce the loss of heat in the form of radiation. (d) Fluorspar & Cryolite	[4]
Question 6		
(i)	(a) Cu (b) Cu - 2e -----> Cu <sup>2+</sup> (c) Electrorefining of copper (d) Anode mud	[4]
(ii)	(a) Ferric chloride (b) Ferric chloride (c) Nitric acid (d) Sulphuric acid	[4]
(iii)	(a) Strong electrostatic force of attraction between ions. (b) Strong affinity towards oxygen.	[2]
Question 7		
(i)	(a) NO <sub>2</sub> (Confirmation test should be given) (b) CO <sub>2</sub> (Confirmation test should be given) (c) N <sub>2</sub> (d) Ethyne	[4]
(ii)	(a) Non-volatile property (b) Acidic property (c) Oxidising property (d) Dehydrating property	[4]
(iii)	(a) Iron (b) Zinc	[2]
Question 8		
(i)	(a) Magnesium nitride and water (b) Mg <sub>3</sub> N <sub>2</sub> + 6H <sub>2</sub> O -----> 3Mg(OH) <sub>2</sub> + 2NH <sub>3</sub> (c) Calcium oxide (d) Hydrochloric acid	[4]
(ii)	(a) 2C <sub>2</sub> H <sub>6</sub> + 7O <sub>2</sub> -----> 4CO <sub>2</sub> + 6H <sub>2</sub> O (30 X 7) / 2 = 105 ml of O <sub>2</sub>	[2 + 2]

	$(30 \times 4) / 2 = 60 \text{ ml of CO}_2$ (b) $2\text{Pb(NO}_3)_2 \longrightarrow 2\text{PbO} + 4\text{NO}_2 + \text{O}_2$ MM of Lead nitrate is 331 g $2 \times 331 \text{ g} \text{ ----- } 5 \times 22.4 \text{ L volumes of gaseous mixture}$ $165.5 \text{ g} \text{ ----- } x \text{ volumes of gaseous mixture}$ $x = (165.5 \times 5 \times 22.4) / 2 \times 331$ $x = 28 \text{ litres of gaseous mixture.}$			
(iii)	Chemical Equation	Name of the process	Identify A. Oxidised substance B. Reduced product	[2]
	$\text{NH}_3 + \text{O}_2 \xrightarrow{\text{Pt}} \text{NO} + \text{H}_2\text{O}$	Catalytic oxidation of ammonia Or Ostwald's process	A. $\text{NH}_3$ B. $\text{H}_2\text{O}$	

## Question Paper 2



### PRELIMINARY EXAMINATION (2025 – 2026)

Subject: Chemistry

Date: January 14, 2026

Std: X A

Time: 2 hours

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 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 paper consists of 12 printed pages.**

---

### SECTION A

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

#### Question 1

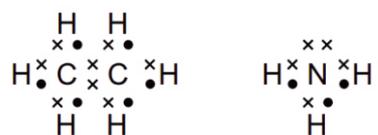
Choose one correct answer to the questions from the given options. [15]

(Do not copy the question, Write the correct answer only.)

- (i) Which row gives the correct tests to identify both ammonia and sulfur dioxide?

	test to identify ammonia	test to identify sulphur dioxide
(a)	damp blue litmus paper	acidified potassium permanganate solution
(b)	damp blue litmus paper	damp red litmus paper
(c)	damp red litmus paper	acidified potassium permanganate solution
(d)	damp red litmus paper	damp blue litmus paper

- (ii) Ethane,  $C_2H_6$ , and ammonia,  $NH_3$ , are covalent compounds. The dot-and-cross diagrams of these compounds are shown.



Which statements are correct?

- A molecule of ethane contains twice as many hydrogen atoms as a molecule of ammonia.
- An unreacted nitrogen atom has five outer electrons.
- In a molecule of ethane, the bond between the carbon atoms is formed by sharing two electrons, one from each carbon atom.

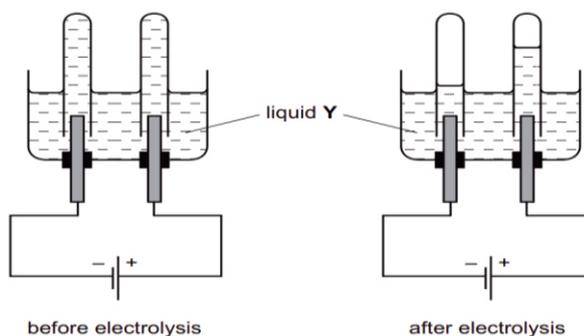
- (a) 1, 2 and 3                      (b) 1 and 2 only  
 (c) 1 and 3 only                    (d) 2 and 3 only

- (iii) When 1 volume of gas R reacts with exactly 5 volumes of oxygen, it forms carbon dioxide and water only.

What is R?

- (a) butane,  $C_4H_{10}$                       (b) ethane,  $C_2H_6$   
 (c) methane,  $CH_4$                       (d) propane,  $C_3H_8$

- (iv) The diagrams show an electrolysis experiment using inert electrodes.



What could liquid Y be?

- (a) aqueous copper (II) sulphate  
 (b) concentrated aqueous sodium chloride  
 (c) dilute sulphuric acid  
 (d) ethanol

- (v) Zinc oxide, reacts with dilute nitric acid, neutralizing the acid.  
Zinc oxide also reacts with aqueous sodium hydroxide, neutralizing the alkali.

Which word best describes zinc oxide?

- (a) acidic (b) alkaline  
(c) amphoteric (d) basic
- (vi) A straight-chain alkene,  $C_4H_8$ , undergoes an addition reaction with bromine.

What is the possible structure of the product?

- (a)  $CH_3CHBrCH_2CH_2Br$  (b)  $CH_3CHBrCHBrCH_3$   
(c)  $CH_2BrCH_2CH_2CH_2Br$  (d)  $CH_3CH_2CH_2CH_2Br$
- (vii) Some properties of compound J are listed.
- It reacts with potassium carbonate to produce carbon dioxide.
  - It reacts with ethanol to produce a sweet-smelling liquid.
  - It reacts with sodium hydroxide to produce a salt.

What is a possible identity of J?

- (a) ethanoic acid (b) ethanol  
(c) ethyl ethanoate (d) ethyl methanoate
- (viii) Which mass of carbon contains the same number of atoms as 16.0 g of sulfur?

- (a) 0.5 g (b) 6.0 g (c) 8.0 g (d) 12.0 g

- (ix) Which element can only be extracted from its ore using electrolysis?

- (a) calcium (b) copper  
(c) lead (d) silver

(x) What is the best method to prepare a pure sample of copper (II) sulphate?

(a) Add copper to aqueous zinc sulphate.

(b) Add copper to dilute sulphuric acid.

(c) Add copper (II) carbonate to aqueous sodium sulphate.

(d) Add copper (II) oxide to dilute sulphuric acid.

(xi) A student makes three suggestions about the Haber process and the Contact process.

1 Only one process uses a raw material obtained by fractional distillation of air.

2 Only one process involves the use of a catalyst.

3 The product of each catalyzed reaction has a formula of the type  $XY_3$ .

Which suggestions are correct?

(a) 1 and 2      (b) 1 and 3      (c) 2 only      (d) 3 only

(xii) Element **X** forms:

- a covalent compound,  $H_2X$
- an ionic compound,  $Na_2X$
- oxides  $XO_2$  and  $XO_3$ .

To which group of the Periodic Table does **X** belong?

(a) IIA      (b) IIIA      (c) IVA      (d) VIA

(xiii) What is the empirical formula of ethanoic acid?

(a)  $CH_2O$       (b)  $CH_4O$       (c)  $C_2H_3O$       (d)  $C_2H_4O_2$

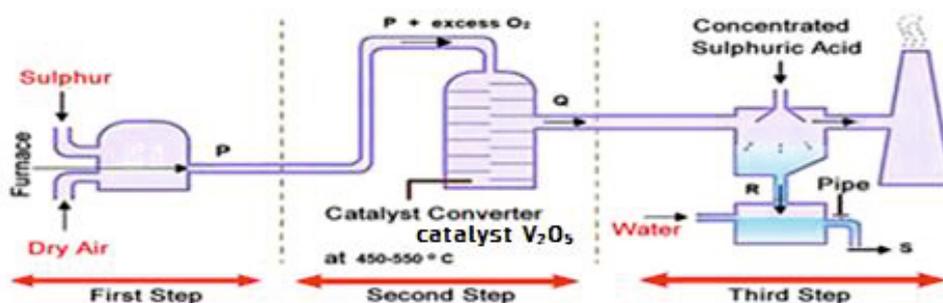
(xiv) Which aqueous reagent liberates ammonia from ammonium sulphate on warming?

(a) calcium nitrate      (b) potassium hydroxide  
(c) sodium chloride      (d) sulphuric acid

- (xv) Assertion (A): Duralumin is widely used in aircraft bodies.  
Reason (R): Duralumin has a very low melting point, which makes it easy to mould into aircraft parts.
- (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

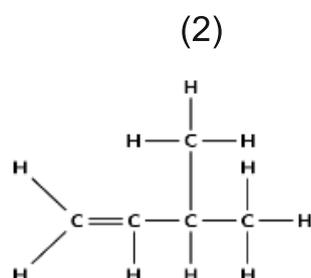
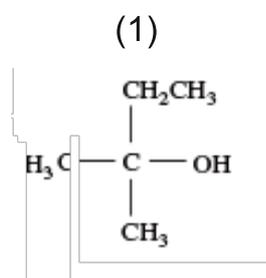
- (i) The following diagram shows a schematic set up for the Industrial preparation of sulphuric acid. [5]
- Answer the questions that follow:



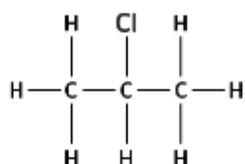
- (a) In the furnace, sulphur burns in dry air to form gas **P**. Identify **P**.
- (b) Gas **P** is mixed with excess oxygen and passed over a  $V_2O_5$  catalyst at  $450-550^\circ C$  in the converter to form gas **Q**. Write balanced equation using the identified names of the compounds **P** and **Q**.
- (c) Gas **Q** is not directly dissolved in water but absorbed in concentrated sulphuric acid to form substance **R**. State one reason why **Q** is not directly dissolved in water.
- (d) Substance **R** is diluted with water in the final stage to obtain product **S**. Write balanced equation for the conversion of **R** to **S** (use the identified names of the compounds of **R** and **S**)
- (e) Why is an optimum temperature of  $450-550^\circ C$  preferred?

- (ii) Identify the following: [5]
- (a) The yellow explosive liquid formed when excess chlorine reacts with ammonia.
  - (b) A hydrocarbon used for welding purposes at high temperatures.
  - (c) An alloy which has copper, zinc and tin.
  - (d) The colour of the precipitate of ferric hydroxide.
  - (e) The process of concentrating the ores of sulphide.
- (iii) Fill in the blanks: [5]
- (a) Down the group non- metallic character \_\_\_\_\_.
  - (b) Quick lime is used to dry \_\_\_\_\_ gas by nature.
  - (c) \_\_\_\_\_ acid is formed when sulphur reacts with concentrated nitric acid.
  - (d) The type of reaction when an insoluble base reacts with an acid is called \_\_\_\_\_.
  - (e) Solder is made of lead and \_\_\_\_\_.
- (iv) Arrange the following as per the instruction given: [5]
- (a) K, Li, Rb, Na (increasing order of metallic character)
  - (b) Oxygen, Sulphur, Calcium, Helium (decreasing order of shells)
  - (c) Carbonic acid, Acetic acid, Phosphoric acid (decreasing order of replaceable H atom)
  - (d) Nitrogen, Krypton, Chlorine (increasing order of valence electron)
  - (e) K, Be, Na (decreasing ionisation potential)
- (v) (a) Draw the structure of the following organic compounds: [2]
- (1) pentan -2-ol
  - (2) 2,3 dibromo propanal

(b) Give the IUPAC name of the following organic compound: [3]



(3)



### Section B

Attempt **any four** out of six questions.

#### Question 3

- (i) Distinguish between the following as directed: [2]
- (a) Magnesium carbonate & Magnesium chloride using dilute acid.
- (b) Zinc nitrate solution & Calcium nitrate solution using NaOH.
- (ii) Identify the **anion** present in each of the following compounds: [2]
- (a) Compound **X** on reacting with silver nitrate solution forms a white precipitate which is soluble in excess of ammonium hydroxide.
- (b) Compound **Y** on reacting with conc. sulphuric acid forms vapours of an acid and this acid decomposes at ordinary temperatures.
- (iii) Draw the electron dot structure of the following: [3]
- (a) The positive ion formed when ammonia is dissolved in water.
- (b) The basic oxide formed when calcium combines with oxygen.
- (c) The first member of the  $\text{C}_n\text{H}_{2n+2}$  series.

[At. No: Ca= 20, O=8, H=1, N=7, C=6]

- (iv) State one relevant observation for each of the following: [3]
- (a) Aluminium reacts with conc. NaOH.
  - (b) Nitric acid reacts with sodium sulphide.
  - (c) Copper chloride reacts with excess NaOH.

#### Question 4

- (i) Calculate the gram molecular mass of chlorine if 308 cm<sup>3</sup> of it at STP weighs 0.979 g. [At. wt. Cl = 35.5] [2]
- (ii) Elements **X** and **Y** belong to period 2 of the periodic table. The ionisation potential of element **X** is less than that of element **Y**. [2]
- (a) Between **X** and **Y**, which will have higher metallic character?
  - (b) Compare the atomic size of **Y** with that of **X**?
- (iii) Write balanced chemical equation for the following conversions: [3]
- (a) Ethyne to ethene
  - (b) Ethyl alcohol to ethyl acetate
  - (c) Ethane to carbon dioxide
- (iv) A teacher demonstrated a series of laboratory experiments using a white crystalline salt **P** and asked the students to observe the changes carefully. [3]

**Step I:** An aqueous solution of salt **P** was treated with ammonium hydroxide solution, added first dropwise and then in excess. A white precipitate was obtained, which remained insoluble in excess ammonium hydroxide.

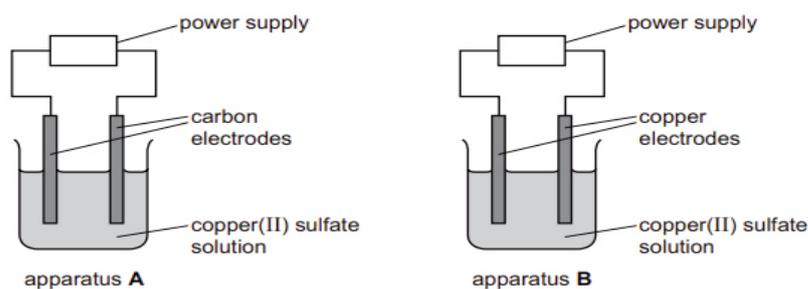
**Step II:** A dry sample of salt **P** was heated strongly in a test tube. A yellow residue **Q** was left behind, while a coloured acidic gas **R**, along with a neutral gas, was evolved.

**Step III:** The residue **Q** was treated with dilute hydrochloric acid, resulting in the formation of a salt and water.

Based on the above observations, identify the compounds **P**, **Q**, and **R**.

### Question 5

- (i) Write balanced chemical equations, for the preparation of the given salts (a) to (c) by using methods 1 to 3 respectively: [3]
1. Displacement
  2. Neutralization by titration
  3. Direct combination
- (a) Aluminium sulphate
- (b) Sodium nitrate
- (c) Iron (III) chloride
- (ii) Define the following: [3]
- (a) Vapour density
  - (b) Electron affinity
  - (c) Flux
- (iii) A student electrolysed copper (II) sulphate solution using the two sets of apparatus shown. [4]



- In apparatus **A** the student used carbon electrodes.
  - In apparatus **B** the student used copper electrodes.
- The student made the following observations.

<i>apparatus A</i>	<i>apparatus B</i>
<i>the mass of the negative electrode increased</i>	<i>the mass of the negative electrode increased</i>
<i>the mass of the positive electrode stayed the same</i>	<i>the mass of the positive electrode decreased</i>
<i>bubbles were seen at the positive electrode</i>	<i>no bubbles were seen at the positive electrode</i>

- (a) Why did the mass of the negative electrode increase in both sets of apparatus?
- (b) Name the gas that formed the bubbles seen in apparatus **A**.
- (c) Write the reaction taking place at the positive electrode in apparatus **B**.
- (d) Explain with reason what happens to the colour of the solution in apparatus **A** as the electrolysis progresses.

### Question 6

- (i) (a) Barium is a reactive metal in Group II of the Periodic Table. [3]  
 Barium reacts with water in a similar way to sodium.  
 The products of the reaction are barium hydroxide and a colourless gas.  
 Write a balanced equation for this reaction.
- (b) Barium oxide reacts with aluminium as shown in the reaction below:
- $$3\text{BaO} + 2\text{Al} \rightarrow 3\text{Ba} + \text{Al}_2\text{O}_3$$
- Explain how in this reaction aluminium acts as a reducing agent.
- (c) A student was asked to prepare insoluble barium sulphate. He was provided with barium nitrate.  
 What additional compound should he choose to prepare barium sulphate?
- (ii) Write balanced chemical equations for the following reactions: [3]
- (a) Hydrated copper sulphate with conc. sulphuric acid
- (b) Ethane with chlorine to form ethyl chloride
- (c) Ammonia gas passed over heated copper oxide
- (iii) In the Modern Periodic Table given below the position of some elements are represented as A, B, C, D, E, F, G. Answer the questions that follow: [4]

Group 	16	17	18
Period 			
1			A
2	B	C	D
3	E	F	G

- (a) Name the element which has the highest ionization potential.
- (b) What type of ions would B, C, E and F form?
- (c) Write the formula of the compound formed between sodium and element B.
- (d) Which element is used as a raw material for the Industrial preparation of sulphuric acid?

### Question 7

- (i) Name the following: [3]
- (a) The anion present in the salt solution which on reacting with barium nitrate solution produces a white precipitate insoluble in dilute acids.
- (b) The chief ore of iron.
- (c) Heating of the ore in the absence of air to a high temperature.
- (ii) Elements A, D and E have the following electronic configuration: [3]

elements	electronic configuration
A	2,8,2
D	2,4
E	2,8,6

Answer the following questions:

- (a) The type of bond formed between AE.
- (b) The element which exhibits catenation.
- (c) The solubility of the compound  $DE_2$  in water.
- (iii)  $20\text{cm}^3$  of a hydrocarbon was burnt in  $175\text{cm}^3$  of oxygen. After cooling, the volume of the remaining gases was  $125\text{cm}^3$ . The addition of aqueous sodium hydroxide removed carbon dioxide leaving behind  $25\text{cm}^3$  of unreacted oxygen. Calculate: [4]
- (a) the volume of oxygen used
- (b) the volume of carbon dioxide formed
- (c) deduce the formula of the hydrocarbon
- (d) write balanced equation for the reaction using the deduced formula

### Question 8

- (i) Match the columns of definition and the term: [3]

	Definition		Term
(a)	The alkali which contains one replaceable hydroxyl ion per molecule of the base	1.	Mono basic acid
(b)	Salt formed by the partial replacement of a hydroxyl radical of a diacidic or triacidic base with an acid radical	2.	Dibasic acid
(c)	The type of acid which reacts with a base to give an acid salt and a normal salt	3.	Basic salt
		4.	Mono acidic base

- (ii) Give reasons for the following: [3]

- (a) Concentrated sodium hydroxide is used to concentrate bauxite ore.
- (b) Graphite rods are preferred over platinum for the electrolysis of molten lead bromide.
- (c) Butane with a straight chain and 2- methylpropane with a branched chain are referred as isomers.

- (iii) A compound, **X**, contains 55.85% carbon, 6.97% hydrogen and 37.18% oxygen. [4]

- (a) Calculate the empirical formula of compound **X**.
- (b) If the relative molecular mass of **X** is 86, find its molecular formula.

**PRELIMINARY EXAMINATION (2025 – 2026)**

**Subject: Chemistry**

**Date: January 14, 2026**

**Std: X A**

**Time: 2 hours**

**Marks: 80**

**SECTION A**

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

<b>Question 1</b>			
	Choose one correct answer to the questions from the given options. (Do not copy the question, Write the correct answer only.)		<b>[15]</b>
(i)	(c) damp red litmus paper	acidified potassium permanganate solution	
(ii)	(a) 1, 2 and 3		
(iii)	(d) propane, C <sub>3</sub> H <sub>8</sub>		
(iv)	(c) dilute sulfuric acid		
(v)	(c) amphoteric		
(vi)	(b) CH <sub>3</sub> CHBrCHBrCH <sub>3</sub>		
(vii)	(a) ethanoic acid		
(viii)	(b) 6 g		
(ix)	(a) calcium		
(x)	(d) Add copper(II) oxide to dilute sulfuric acid.		
(xi)	(b) 1 and 3		
(xii)	(d) VIA		
(xiii)	(a) CH <sub>2</sub> O		
(xiv)	(b) potassium hydroxide		
(xv)	(b) Both A and R are true but R is not the correct explanation of A.		
<b>Question 2</b>			
(i)	(a) SO <sub>2</sub> . (b) 2SO <sub>2</sub> + O <sub>2</sub> → 2SO <sub>3</sub> (c) As the reaction is exothermic and will form vapours of conc. acid which is difficult to condense and will corrode the machinery.		<b>[5]</b>



	(ii)	Identify the anion present in each of the following compounds: (a) Chloride ion (b) Nitrate ion	[2]
	(iii)	Draw the electron dot structure of the following: (a) $\left[ \begin{array}{c} \text{H} \\ \times \times \\ \text{H} \times \text{N} \times \text{H} \\ \cdot \times \\ \text{H} \end{array} \right]^+$ (b) $\text{Ca}^{2+} \left[ \begin{array}{c} \cdot \cdot \\ \times \text{O} \times \\ \cdot \cdot \end{array} \right]^{2-}$ (c) The first member of the alkane series. $\begin{array}{c} \text{H} \\ \cdot \\ \text{H} \cdot \times \text{C} \times \text{H} \\ \cdot \\ \text{H} \end{array}$	[3]
	(iv)	State one relevant observation for each of the following: (a) Colourless gas which extinguishes a burning splinter with a pop sound is released (b) A gas with rotten egg smell is released (c) Blue ppt insoluble in excess	[3]
<b>Question 4</b>			
	(i)	$308 \text{ cm}^3$ of chlorine weighs = 0.979 g $\therefore 22400 \text{ cm}^3$ of chlorine at STP will weigh = $\frac{0.979 \times 22400}{308}$ = 71.2 g	[2]
	(ii)	(a) X (b) Y is smaller than X	[2]
	(iii)	Write balanced chemical equation for the following conversions: (a) $\text{C}_2\text{H}_2 + \text{H}_2 \rightarrow \text{C}_2\text{H}_4$ (b) $\text{C}_2\text{H}_5\text{OH} + \text{CH}_3\text{COOH} \xrightarrow{\text{conc. H}_2\text{SO}_4} \text{CH}_3\text{COOC}_2\text{H}_5 + \text{H}_2\text{O}$ (c) $2\text{C}_2\text{H}_6 + 7\text{O}_2 \rightarrow 4\text{CO}_2 + 6\text{H}_2\text{O}$	[3]
	(iv)	P- Lead nitrate Q- PbO R – nitrogen dioxide	[3]
<b>Question 5</b>			
	(i)	(a) $2\text{Al} + 3\text{H}_2\text{SO}_4 \rightarrow \text{Al}_2(\text{SO}_4)_3 + 3\text{H}_2$ (b) $\text{NaOH} + \text{HNO}_3 \rightarrow \text{NaNO}_3 + \text{H}_2\text{O}$ (c) $2\text{Fe} + 3\text{Cl}_2 \rightarrow 2\text{FeCl}_3$	[3]

	(ii)	Define the following: (a) Vapour density- Ratio of the mass of certain volume of gas to the mass of an equal volume of hydrogen (b) Electron affinity- The amount of energy released when a neutral gaseous atom accepts an electron to form a negative ion. (c) Flux- The substance added to get rid of the matrix.	[3]
	(iii)	(a) copper formed/copper deposited (b) oxygen (c) $\text{Cu} - 2\text{e}^- \rightarrow \text{Cu}^{2+}$ (d): solution becomes paler/fades in A. Copper ions removed (but not added) copper ions not replaced in A	[4]
<b>Question 6</b>			
	(i)	(a) $\text{Ba} + 2\text{H}_2\text{O} \rightarrow \text{Ba}(\text{OH})_2 + \text{H}_2$ (b) Al reduces barium oxide to barium and itself got oxidized. (c) any soluble sulphate salt	[3]
	(ii)	Write balanced chemical equation for the following reactions:	[3]
		(a) $\text{CuSO}_4 \cdot 5\text{H}_2\text{O} \xrightarrow{\text{conc. H}_2\text{SO}_4} \text{CuSO}_4 + 5\text{H}_2\text{O}$ (b) $\text{C}_2\text{H}_6 + \text{Cl}_2 \rightarrow \text{C}_2\text{H}_5\text{Cl} + \text{HCl}$ (c) $3\text{CuO} + 2\text{NH}_3 \rightarrow 3\text{Cu} + 3\text{H}_2\text{O} + \text{N}_2$	
	(iii)	(a) A                      (b) Anions/ negative ion                      (c) $\text{Na}_2\text{B}$ (d) E	[4]
<b>Question 7</b>			
	(i)	(a) Sulphate ion                      (b) Haematite                      (c) Calcination	[3]
	(ii)	(a) Ionic bond                      (b) D                      (c) insoluble	[3]
	(iii)	(a) volume of oxygen used = $150 \text{ cm}^3$ [1] (b) volume of carbon dioxide formed = $100 \text{ cm}^3$ [1] (c) $\text{C}_5\text{H}_{10}$ [1] (d) $2\text{C}_5\text{H}_{10} + 15\text{O}_2 \rightarrow 10\text{CO}_2 + 10\text{H}_2\text{O}$ [1]	[4]
<b>Question 8</b>			
	(i)	(a) 4                      (b) 3                      (c) 2	[3]

	(ii)	<p>Give reasons for the following:</p> <p>(a) As the ore is amphoteric by nature the impurities like ferric oxide and silicon dioxide will not react with NaOH and can be filtered but aluminium oxide will react with NaOH and can be filtered as a filtrate.</p> <p>(b) Graphite rods are preferred over platinum for the electrolysis of molten lead bromide as they are unaffected by bromine vapours.</p> <p>(c) As they have same molecular formula but different structural formula</p>	[3]
	(iii)	<p><b>M1 55.85/12 and 6.97(/1) and 37.2/16;</b>  <b>or evaluation 4.650 6.970 2.325;</b>  <b>M2 C<sub>2</sub>H<sub>3</sub>O;</b>  <b>correct answer with no working = [2]</b></p> <hr/> <p><b>M1 (86/)43;</b>  <b>M2 C<sub>4</sub>H<sub>6</sub>O<sub>2</sub>;</b>  <b>correct answer with no working = [2]</b></p>	[4]

\*\*\*\*\*

## Question Paper 3

SMT. SULOCHANADEVI SINGHANIA SCHOOL, THANE.

Class	Subject	Exam	Date	Time	Marks	SET B
						No. of printed pages
10th	Chemistry	Prelim	09/01/26	2 hrs	80	8

This question paper is divided into two sections.

**Section-A** is compulsory. Attempt **any four** main questions from **Section B**.

The intended marks of 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:

[15]

i. The atomic number of an element is 13. It belongs to \_\_\_\_\_

- a. Third period and group 3
- b. Second period and group 3
- c. Third period and group 13
- d. Second period and group 13

ii. The alkyl group in ethanal is

- a. Alkyl
- b. Ethyl
- c. Methyl
- d. Propyl

iii. Three separate samples of an aqueous solution of compound Q are tested. The results of the tests are shown below.

Sample of compound Q	Tests	Observations
Sample 1	Add silver nitrate solution	White precipitate, soluble in excess ammonium hydroxide
Sample 2	Add aqueous ammonia $\text{NH}_4\text{OH}$	White precipitate, soluble in excess
Sample 3	Add aqueous sodium hydroxide	White precipitate, soluble in excess

The compound Q is:

- a. Calcium chloride
- b. Lead sulphate
- c. Zinc chloride
- d. Zinc sulphate

iv.

The table shown below gives information about four substances A, B, C and D

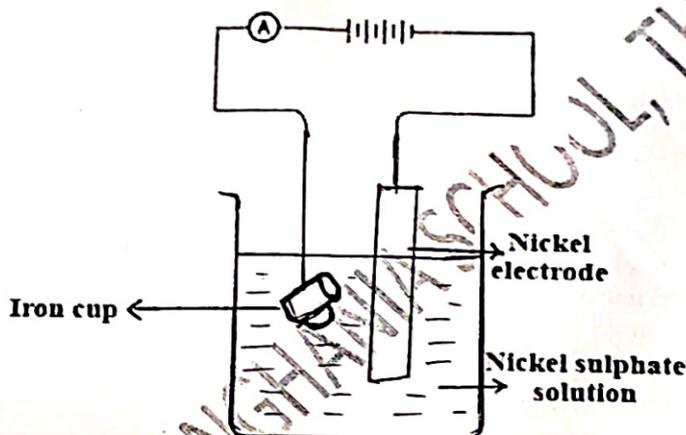
Substances	Melting point	Electrical conductivity	
		Solid state	Liquid/aqueous solution
A	295	Good	Good
B	1890	Poor	Good
C	1290	Poor	Good
D	1160	poor	poor

Identify the ionic compounds from the above given substances

- a. A, B
- b. B, C
- c. A, B, D
- d. A, C, D

v.

The diagram shows apparatus used to electroplate a cup with nickel metal.



The experiment did not work.

What change is needed in the experiment to make it work?

- a. Add Iron sulphate solution instead of nickel sulphate.
- b. Replace the nickel electrode with a graphite electrode.
- c. Reverse the connections of the battery.
- d. Increase the temperature of the electrolyte.

vi.

Bromine water is a reddish-brown solution. When bromine water is added, which of the following compounds, would get decolourised?

- a.  $C_3H_9$
- b.  $C_2H_6$
- c.  $C_7H_{16}$
- d.  $C_4H_8$

vii.

A gas X cannot be dried using conc  $H_2SO_4$  because it forms a white solid when passed through it. X is most likely

- a. HCl
- b.  $NH_3$
- c.  $CO_2$
- d.  $SO_2$

The nitrate on thermal decomposition gives a metal oxide which can react both with acid and an alkali to give salt and water.

- a. Calcium nitrate
  - b. Potassium nitrate
  - c. Copper nitrate
  - d. Zinc nitrate
- viii. Copper metal when reacts with cold dilute nitric acid it liberates
- a. Hydrogen gas
  - b. Nitrogen dioxide gas
  - c. Nitrogen monoxide gas
  - d. Oxygen gas
- ix. Identify the correct method of preparation of lead carbonate from lead hydroxide.
- a. Precipitation
  - b. Precipitation and then neutralisation
  - c. Neutralisation followed by precipitation
  - d. Decomposition by acids and then precipitation
- x. Which oxide cannot be reduced by carbon under any industrial temperature?
- a. ZnO
  - b. Fe<sub>2</sub>O<sub>3</sub>
  - c. CaO
  - d. PbO
- xi. When a compound was electrolysed using inert electrodes, the gas released at the anode rekindles a glowing splinter. The compound that will produce this observation at anode is
- P. Dilute Sodium chloride solution
  - Q. Dilute Copper sulphate solution
  - R. Concentrated NaCl solution
  - S. Pure water
- Which is the correct option?
- a. P and Q
  - b. P, Q and S
  - c. Q and S
  - d. P and R
- xii. When a salt is treated with sodium hydroxide solution it gives gas X. On passing excess of gas X through reagent Y a brown colour precipitate is formed. X and Y respectively are-
- a. X=HCl and Y = NH<sub>4</sub>Cl
  - b. X = NH<sub>3</sub> and Y= HgO
  - c. X= NH<sub>3</sub> and Y= K<sub>2</sub>HgI<sub>4</sub>
  - d. X=NH<sub>4</sub>Cl and Y= KOH

xiii. Two statements are given one labelled Assertion(A) and other labelled Reason(R). Select the correct answer to the questions from the a, b, c and d as given below.

**Assertion:** Strength of the acid or base decreases with dilution

**Reason:** ionisation of an acid or a base increase with dilution.

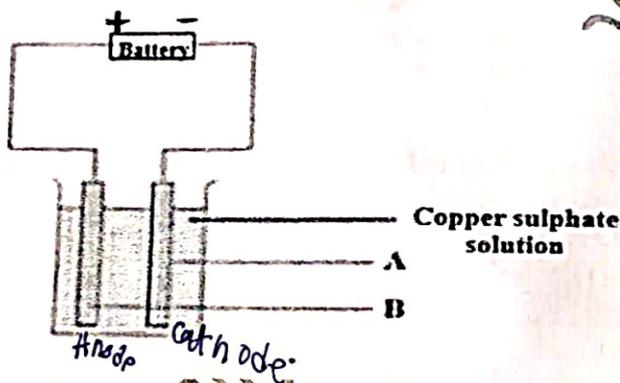
- a. Both A and R are true and R is correct explanation of the assertion
- b. Both A and R are true, but R is not the correct explanation of the assertion
- c. A is true, but r is false
- d. A is false, but R is true.

ix. Which contain more molecules?

- a. 3g Hydrogen
- b. 32g Oxygen
- c. 28g Nitrogen
- d. 44g Carbon dioxide

Question 2

Li. The diagram shows an electrolysis of copper sulphate using platinum electrode. [5]



- i. Which is the oxidising electrode A or B and write the reaction taking place at this electrode.
- ii. Which electrode reddish brown metal will deposit A or B.
- iii. Will the concentration of copper ions increase, decrease or remain same in the electrolytic solution. Justify your answer.
- iv. What happens when platinum electrode is replaced with copper electrodes.

ii. Match the Column A with Column B and write answers as (a...1, b...2....) [5]

Column A	Column B
a. Copper hydroxide	1. Rubidium
b. Lead	2. Reddish brown
c. Alkali metal	3. Silvery grey
d. Copper	4. Strontium
e. Alkaline earth metal	5. Pale blue

iii. A] Fill in the blanks by choosing the correct options given in the brackets: [3]

- a. Hot concentrated alkali when reacts with \_\_\_\_\_ (lead/potassium) gives hydrogen gas.
- b. The element at the bottom of a group would show \_\_\_\_\_ (less /more) metallic character than the element at the top.
- c. The indicator which turns pink on passage of hydrogen chloride gas is \_\_\_\_\_ (methyl orange/ phenolphthalein).

B) Find the mass of lead formed by reduction of 344g of red lead ( $Pb_3O_4$ ) in a current of hydrogen and also find the volume of hydrogen used up at STP. [ $Pb=208, O=16, H=1$ ]



[2]

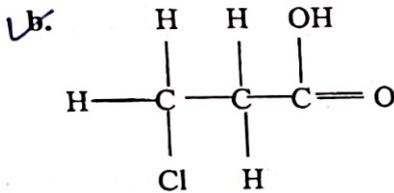
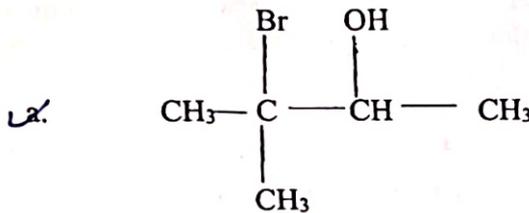
iv) Identify the following:

[5]

- a. The compound formed when concentrated nitric acid accidentally falls on skin.
- b. A weak acid which when reacts with base can form only a normal salt.
- c. The acid on mixing with lead nitrate solution produces a white precipitate which is insoluble even on heating.
- d. The amount of energy released when an atom in a gaseous state accepts electron to form an anion.
- e. The method to separate ores from matrix based on difference in preferential wetting.

v) Give the IUPAC name of the following compound:

[2]



B) Draw the structure of the following compounds:

[3]

- a. Acetylene  $C_2H_2$
- b. 2-bromo propanal
- c. 4-methyl pent-2-ene

SECTION B (40 marks)

(Attempt any four main questions)

Question 3

9

i) Give a balanced chemical equation for the following:

[3]

- a. Reduction of manganese dioxide using concentrated hydrochloric acid.
- b. Catalytic oxidation of sulphur dioxide to sulphur trioxide.
- c. Oxidation of carbon using concentrated nitric acid.

ii) You are given the following information about four elements P, Q, R and S:

P has the lowest ionisation potential in its period.

metal  $\downarrow$  atom size

Q has atomic no. 13.

R has 7 valence electrons

S is an alkaline earth metal in period 3.

Use the above information and answer the following: [Do not identify the elements]

[4]

- Q. Between P and S which one will have a larger atomic radius? Give reason.  
 Write the formula of the compound formed between Q and R.  
 State the type of bond formed between P and R.  
 Arrange P, Q, R in increasing electronegativity.

[3]

iii. Give reason:

- Powdered coke is sprinkled on the electrolytic mixture during extraction of aluminium from its ore.  
 Liquid ammonia is used as refrigerant in ice plants.  
 Concentrated nitric acid is mostly stored in ambered coloured bottle.

Question 4

i. An organic compound is found to possess H=6.7% and O = 53.3% and remaining is carbon. its vapour density is 30. Find the molecular formula of the compound? [atomic weight of H=1, O=16, C=12].  $C_2H_4O_2$

[3]

ii. On thermal decomposition of metallic nitrate X, a colourless gas Y and a coloured gas Z is released along with the residue W. W on reduction with ammonia forms greyish metal V.

[2]

a. Identify X and W. Give a balanced chemical equation for thermal decomposition of X.

b. What will be the colour of the residue W.

iii. Complete the table:

[2]

Metal	Name of its alloy	Composition of the alloy
Iron	a. _____	b. _____

iv. Rahul sets up an experiment of electroplating spoon with silver. Answer the questions based on the experiment:

[3]

a. Name the electrolyte preferred in this process and why?

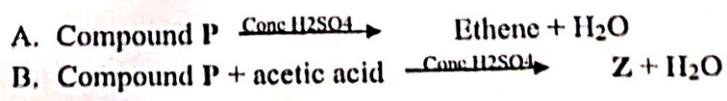
b. Which equation for the reaction at the anode is correct?

- $Ag \rightarrow Ag^{1+} + 1e^{-}$
- $Ag + 1e^{-} \rightarrow Ag^{1+}$
- $Ag^{1+} - 1e^{-} \rightarrow Ag$
- $Ag^{2+} + 2e^{-} \rightarrow Ag$

c. What will you observe at anode during the experiment?

Question 5: \*

i. Below are the few reactions of compound P analyse them and answer the following: [4]



a. Identify P and give a completely balanced equation for the reaction (A).

- b. Give the chemical formula of Z and state the type of reaction involved when P reacts with acetic acid.  
c. What is glacial acetic acid?

- ii. 120 ml of methane on complete combustion gives 300 ml oxygen assuming water condenses. Calculate the volume of carbon dioxide and any leftover gas, if any. [2]



- iii. You are provided with list of chemicals mentioned in the bracket:

[ Sodium , Iron, Chlorine , Lead , sulphur , sodium carbonate, dilute hydrochloric acid, dilute sulphuric acid ,lead nitrate, hydrogen sulphide, sodium sulphate]

Using suitable chemicals from the list given. write a balanced chemical equations for the preparation of the salt given below : [3]

- a. Ferrous sulphide  
b. Lead sulphate  
c. Sodium chloride

- iv. Richa finds two unlabelled test tubes in laboratory. She knows that both contain sulphuric acid, one **concentrated** and the other **dilute**. Using **copper metal**, how will she identify the concentrated sulphuric acid. State her observation in both the test tubes. [1]

Question 6. ✓

- i. How will you prepare: [3]

- a. Methane from sodium acetate  
b. Ethyne from calcium carbide  
c. Ethane from ethene

- ii. Explain why? [2]

- a. Magnesium chloride has high melting point and boiling point.  
b. Atomic size decreases across a period in the periodic table.

- iii. Draw the electron dot diagram of the following compounds: [2]

- a. Calcium oxide  
b. Nitrogen molecule

- iv. Solve: -

- a. Calculate the VD and molecular mass of gas X if 200ml of the gas at s.t.p weighs 0.40g. [1litre of H<sub>2</sub> at s.t.p weighs 0.09g] [2]  
b. Calculate the volume at STP occupied by ethane gas(C<sub>2</sub>H<sub>6</sub>). (atomic weight of C=12, H=1) [1]

Question 7. ✓

- i. State your observation: [4]

- a. Concentrated sulphuric acid is poured on sugar crystals.  
b. Dilute hydrochloric acid is added to potassium carbonate.  
c. At anode during electrolysis of molten lead bromide.  
d. Concentrated nitric acid is added to Sulphur

vi. Identify the following: [2]

- a. The compound used for welding and cutting of metals
- b. The gas formed sodium metal is added to ethanol.
- c. The 3<sup>rd</sup> member of homologous series of alkene.
- d. The type of reaction when chlorine reacts methane under diffused sunlight.

vii. Complete the following table given below pertaining to laboratory method of preparation and write answers as a. \_\_\_ b. \_\_\_ [3]

Laboratory preparation of	Reaction with all conditions	Drying agent	Method of collection
HCl	a. _____	b. _____	c. _____

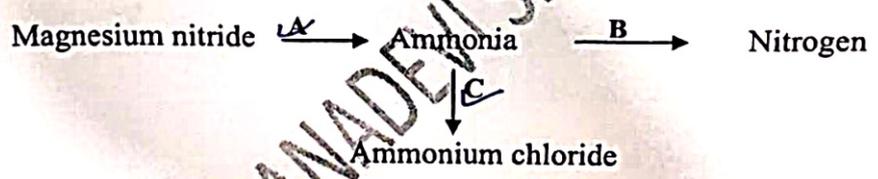
viii. Name the laboratory method of preparation of hydrochloric acid. [1]

Question 8. (8)

i. The following questions are related to the extraction of aluminium from its ores [5]

- a. Name the solution used to react with bauxite ore as a first step in obtaining pure aluminium oxide, give the suitable reason for addition of this solution.
- b. Name the process of conversion of bauxite ore to pure aluminium oxide,
- c. Give a balanced equation for the reaction in (a).
- d. Name an aluminium alloy and write the composition of this alloy.

ii. Give balanced equations with conditions if any for the following conversions. [3]



iii. Draw the electron dot diagram showing formation of positive ion formed when an acid dissolves in water. [2]

\*\*\*\*\*

SMT SULOCHANDRAN DEVI SMT

SMT, THANE



Narsee Monjee Educational Trust's  
**JAMNABAI NARSEE SCHOOL**  
Narsee Monjee Bhavan, Narsee Monjee Marg,  
N.S. Road No. 7, J.V.P.D. Scheme,  
Vile Parle (W), Mumbai - 400 049, India.

✉ contactus@jns.ac.in  
☎ +91 22 6915 7575 / 6915 7576  
🌐 www.jns.ac.in

## SECOND PRELIMINARY EXAMINATION – JANUARY 2026 CHEMISTRY

Std. 10  
Duration: 2 hrs.  
Marks: 80  
Date: 05.01.2026

*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 paper consists of 10 printed pages.*

### SECTION A

*(Attempt all questions from this Section.)*

[15]

#### Question 1

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

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

(i) Which of the following statement/s is/ are incorrect about alkaline earth metals?

1. Ionization potential decreases with an increase in atomic number.
2. Reducing nature increases with a decrease in atomic number.
3. Electron affinity decreases with an increase in atomic number.
4. Metallic character is greater than alkali metals.

- (a) 1 and 4  
(b) 2 and 4  
(c) Only 4  
(d) Only 2

(ii) Compound 'X' consists only of molecules. Hence, compound 'X' will \_\_\_\_\_.

- (a) be a crystalline hard solid  
(b) not undergo ionization on passage of electric current in its solution state  
(c) have strong force of attraction between its molecules  
(d) have the properties given in (a) and (c) only

(iii) Which of the following has the maximum number of atoms?

- (a) 1 g of  $\text{Li}_{(s)}$  [ $\text{Li} = 7$ ]
- (b) 1 g of  $\text{O}_{2(g)}$  [ $\text{O} = 16$ ]
- (c) 1 g of  $\text{Mg}_{(s)}$  [ $\text{Mg} = 24$ ]
- (d) 1 g of  $\text{Ag}_{(s)}$  [ $\text{Ag} = 108$ ]

(iv) Test tube 'A' contains dry hydrogen chloride gas, 'B' contains hydrogen chloride gas dissolved in water, 'C' contains hydrogen chloride gas dissolved in toluene and 'D' contains liquified hydrogen chloride gas. Which of the following will be observed when an alkaline phenolphthalein is added to each test tube?

	Test tube A	Test tube B	Test tube C	Test tube D
(a)	no change	turns pink	no change	no change
(b)	no change	turns pink	no change	turns pink
(c)	no change	turns colourless	no change	no change
(d)	no change	turns colourless	no change	turns pink

(v) **Assertion (A):** During electrolysis of conc.  $\text{NaCl}$  solution, despite high concentration of  $\text{Na}^+$ ,  $\text{H}_2$  is evolved at the cathode.

**Reason (R):**  $\text{H}^+$  undergoes reduction more easily than  $\text{Na}^+$ .

- (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.

(vi) Which of the following alloys do not contain copper?

- (a) Brass
- (b) Solder
- (c) Duralium
- (d) Both (b) and (c)

(vii) The addition of water inside the flask containing  $\text{HCl}$  gas in the fountain experiment, \_\_\_\_\_ the \_\_\_\_\_ inside the flask.

- (a) increases, pressure
- (b) decreases, volume
- (c) lowers, pressure
- (d) lowers, temperature

(vi) **Assertion (A):** Liquor ammonia is a weak base.

**Reason (R):** There is a lone pair of electrons on the nitrogen atom in ammonia molecule.

- (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.

(ix) What do you observe when sodium nitrate is heated?

- (a) Sodium nitrate does not decompose on heating.
- (b) A reddish-brown acidic gas is evolved which turns moist potassium iodide paper brown.
- (c) A colourless odourless neutral gas is evolved which rekindles a burning splinter.
- (d) Both (b) and (c)

(x) Which of the following is **NOT** true about conc.  $H_2SO_4$ .

1. It has strong affinity for water.
  2. It can remove water of crystallization from a hydrated crystal.
  3. It is used as a drying agent to dry  $H_2S$ .
  4. It is used to remove water in the reaction of esterification.
- (a) 2 and 4
  - (b) Only 4
  - (c) Only 3
  - (d) 3 and 4

(xi) During the preparation of ethylene from ethanol, the impurities formed by oxidation of the hot acid can be removed by passing the vapours of ethylene through \_\_\_\_\_.

- (a) fused  $CaCl_2$
- (b)  $NaOH$  solution
- (c)  $Pb(NO_3)_2$  solution
- (d) conc.  $H_2SO_4$

(xii) On a graph paper, when the atomic size is plotted against the atomic number, the peaks in the graph are occupied by \_\_\_\_\_.

- (a) halogens
- (b) alkali metals
- (c) noble gases
- (d) Both (b) and (c)

(xiii) Sam heated a crystalline solid 'A' with slaked lime and observed the release of a pungent smelling gas. When he added lead nitrate solution to the solution of 'A,' he observed a white insoluble precipitate. What is the anion present in solid 'A'?

- (a) sulphide
- (b) oxide
- (c) chloride
- (d) sulphate

(xiv) What is the amount of carbon dioxide produced when 50g of limestone is heated?

[Ca=40, C=12, O=16]

- (a) 2 moles
- (b) 0.5 mole
- (c) 0.25 mole
- (d) 1 mole

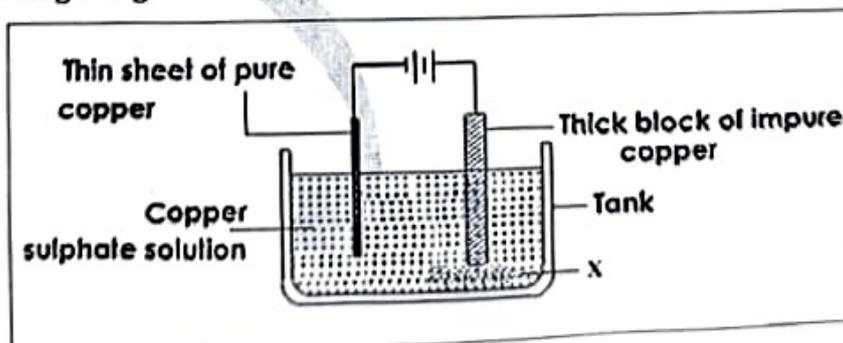
(xv) Lauren is performing an experiment in the school laboratory to differentiate between two colourless solutions 'A' and 'B'. She added another colourless solution 'C' to each of the solutions to complete the test successfully. Which of the following groups of solutions is Lauren working with?

- (a) A =  $K_2CO_3$ , B =  $K_2SO_3$ , C =  $BaCl_2$
- (b) A =  $PbSO_3$ , B =  $ZnSO_3$ , C =  $NH_4OH$
- (c) A =  $HCl$ , B =  $H_2SO_4$ , C =  $Ba(NO_3)_2$
- (d) A =  $NaCl$ , B =  $KCl$ , C =  $NH_4OH$

### Question 2

(i) Observe the diagram given below and answer the questions that follow:

[5]



- (a) Define the process that is illustrated in the diagram.
- (b) Identify the anode and cathode from the diagram.
- (c) Write the reactions that take place at anode and cathode.
- (d) Name the insoluble substances that can be present in 'X'.

(ii) Identify the following:

[5]

- (a) The phenomenon where two or more compounds have the same molecular formula but different arrangements of those atoms, leading to distinct physical properties. *isomerism*
- (b) The strength of an acid or a base expressed in terms of hydrogen ion concentration. *pH value*
- (c) Heating carbonate ores in absence of air to form their corresponding oxides. *calcination*
- (d) The electrolytic process of deposition of a superior metal on the surface of a base metal. *electroplating*
- (e) The ratio between the mass of a certain volume of vapour to the mass of same volume of hydrogen under similar conditions of temperature and pressure. *molar volume*

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

[5]

- (a) Decarboxylation of sodium acetate by \_\_\_\_\_ (*soda lime/alc. KOH*) produces methane gas.
- (b) \_\_\_\_\_ (*CO<sub>2</sub>/H<sub>2</sub>CO<sub>3</sub>*) is the oxidized product formed when hot conc. HNO<sub>3</sub> is reacted with carbon.
- (c) Catalytic oxidation of sulphur dioxide is an \_\_\_\_\_ (*exothermic/endothermic*) reaction.
- (d) Fountain experiment using HCl gas will form a \_\_\_\_\_ (*pink/yellow*) fountain with methyl orange.
- (e) Reduction of concentrated mercuric oxide is done by using \_\_\_\_\_ (*thermal decomposition/reducing agents like hydrogen*).

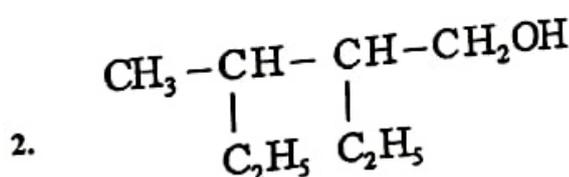
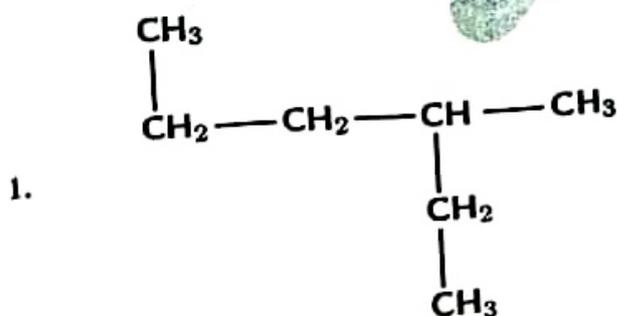
(iv) Match Column A with Column B. Each answer should be used only once:

[5]

Column A	Column B
(a) Zinc chloride from zinc oxide	1. Synthesis
(b) Potassium chloride from potassium hydroxide	2. Simple displacement
(c) Iron (III) chloride from iron	3. Titration
(d) Silver (I) chloride from silver nitrate	4. Neutralization
(e) Iron (II) chloride from iron	5. Precipitation

(v) (a) Give the IUPAC name of the following:

[2]



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

[3]

- The chain isomer of 1 - chloro butane.
- The final product formed when excess bromine is passed through a solution of acetylene in an inert solvent.
- The compound formed on halogenation of acetylene dichloride.

**SECTION B**

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

**Question 3**

**(i) Name the following:**

[2]

- The soluble salt formed when excess sodium hydroxide solution is added to a solution of lead nitrate.
- The black residue obtained when  $H_2S$  gas is passed through a solution of lead acetate.

**(ii) Draw the electron dot structures of the following molecules:**

[2]

- The solid residue left behind when calcium nitrate is heated.
- The gas formed when methyl iodide is reduced with nascent hydrogen.

**(iii) The positions of elements 'A', 'B' and 'C' in the periodic table are given below. Study the diagram and answer the questions that follow:**

[3]

	A	
	$\begin{matrix} 24 \\ X \\ 12 \end{matrix}$	
C	B	$\begin{matrix} 45 \\ Y \\ 21 \end{matrix}$
	$\begin{matrix} 88 \\ Y \\ 38 \end{matrix}$	

- Is element 'B' a metal, metalloid or a non-metal?
- Will element 'A' be more reactive or less reactive than 'C'?
- Which element is the largest amongst elements 'A', 'B' and 'C'?

**(iv) A compound contains 59.31% of element 'X' and 40.69% of element 'Y'. If the vapour density of the compound is 349, find the molecular formula of the compound.**

[3]

[X = 207, Y = 35.5]



**Question 4**

- (i) Give one relevant observation for each of the following: [2]
- (a) Aluminium is reacted with hot and conc. NaOH.
- (b) Manganese is added to very dilute (1%), cold HNO<sub>3</sub>.

- (ii) Give a chemical test to distinguish between the following pairs of compounds: [2]
- (a) NaOH and NH<sub>4</sub>OH (using a colourless solution)
- (b) K<sub>2</sub>CO<sub>3</sub> and K<sub>2</sub>SO<sub>4</sub> (using a chloride of an alkaline earth metal)

- (iii) Paul works in a gas company and is responsible for determining the calorific value of the gases, which helps assess how much energy the fuel can produce when burned. For assessing the calorific value of the gases, they are burnt with oxygen. Based on the information given, complete the table given below (Do not draw the table again): [3]

Gas	Amount of gas burnt (ml)	Amount of oxygen used (ml)
A - used in hydrogenation of oils	200	(a) _____
B - major component of marsh gas	50	(b) _____
C - second member of the paraffins series	(c) _____	2100

- (iv) Claire works in an industry which manufactures car batteries. She has to select the best electrolyte for the same. Based on the information given in the table below, answer the questions that follow: [3]

Sample	Observation on passage of electric current	Recommended to be used in manufacturing of car batteries
A	Bulb does not glow	Not recommended
B	Bulb glows brightly	Strongly recommended
C	Bulb glows dimly	Not recommended

- (a) What type of particles are present in sample 'C'?
- (b) Give two examples of compounds that can be present in sample 'A'.
- (c) What will be the colour change in the universal indicator when a few drops of sample 'B' are added to it?

**Question 5**

- (i) A gas cylinder contains  $24 \times 10^{24}$  molecules of nitrogen gas S.T.P. If the relative atomic mass of nitrogen is 14 and Avogadro's number is  $6 \times 10^{23}$ , calculate: [2]
- (a) The mass of nitrogen gas in the cylinder.
  - (b) The volume of nitrogen in the cylinder.
- (ii) Name the alloy which finds its application in each of the following cases: [2]
- (a) Mike is working at a construction site and is responsible for installing the wiring system with electrical fittings.
  - (b) Dr. Nichole is getting ready to perform surgery to save a patient's life.
- (iii) Answer the following questions with respect to the industrial preparation of sulphuric acid: [3]
- (a) Give the balanced chemical equation for the formation of  $\text{SO}_2$  on roasting of a metallic ore.
  - (b) Why is vanadium pentoxide preferred over platinum as a catalyst?
  - (c) Give the balanced chemical equation which represents the dilution of pyrosulphuric acid.
- (iv) Write balanced equations for the following conversions: [3]
- (a) Ethanol from ethyl bromide
  - (b) Ethene from ethyl bromide
  - (c) Ethane from ethyl bromide

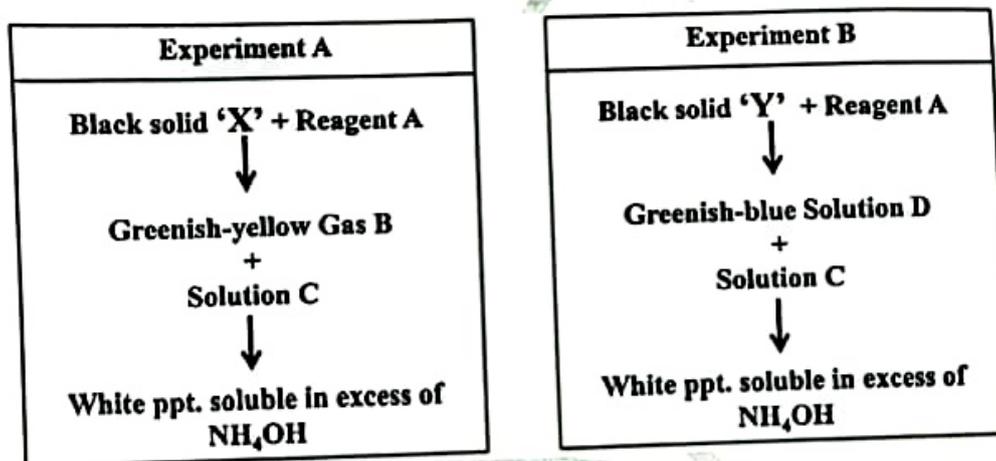
**Question 6**

- (i) Give the empirical formula of the following compounds: [2]
- (a) The first member of the carboxylic acid series.
  - (b) The third member of the acetylene series.
- (ii) Joel works in a chemical factory. He separates the two constituents of water gas by passing the mixture with extra steam over heated iron catalyst. One of the gas is oxidized and dissolved under pressure in aqueous KOH. The gas left behind is mixed with one of the gases of air to form an alkaline gas 'A' which is used for various industrial purposes. [2]
- (a) Write the balanced chemical equation for the industrial manufacturing process of gas 'A'.
  - (b) What will be observed when gas 'A' is passed over heated basic oxide?

(iii) Give reasons for the following:

- (a) Chlorine has higher electron affinity than fluorine. [3]  
 (b) Conc. caustic soda is used to separate aluminium ore from the gangue.  
 (c) Liquid ammonia is neutral to dry litmus, but liquor ammonia turns red litmus solution blue.

(iv) Maurice is giving his practical examination. He performs a set of experiments as given in the flow chart. Study the chart and answer the questions that follow: [3]



- (a) Identify 'X' and 'Y'.  
 (b) What is the role of 'X' and 'Y' in both cases?  
 (c) Write the balanced chemical equation for the reaction that takes place between 'D' and 'C'.

Question 7

(i) Define the following: [2]

- (a) Covalency  
 (b) Constant boiling mixture

(ii) Organic compounds 'A' and 'B' have the same empirical formula  $\text{CH}_2\text{O}$ . The general formulae of 'A' and 'B' are  $\text{C}_n\text{H}_{2n+1}\text{COOH}$  and  $\text{C}_n\text{H}_{2n+1}\text{CHO}$  respectively. Draw the structures of 'A' and 'B' and write their IUPAC names: [2]

(iii) Name the gas evolved/ formed in each of the following cases: [3]

- (a) Hydrolysis of calcium carbide.  
 (b) Sulphur is oxidized by conc.  $\text{HNO}_3$ .  
 (c) Dil.  $\text{HNO}_3$  is reacted with copper metal.

(iv) Give balanced chemical equations for the following conversions:

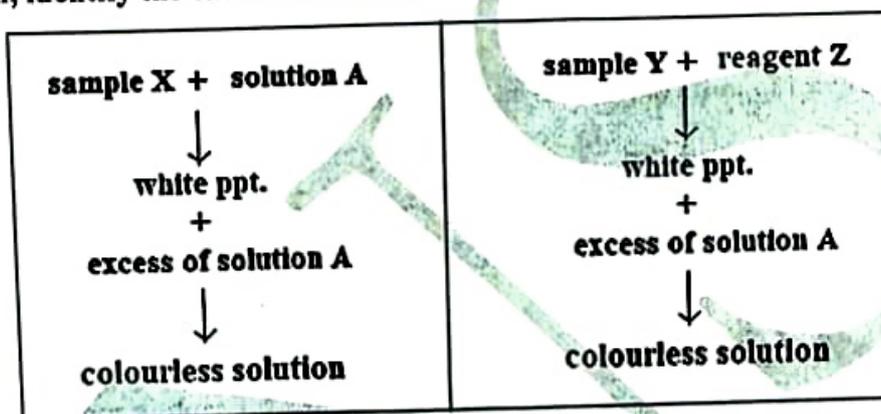
[3]



**Question 8**

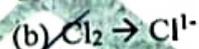
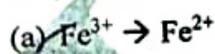
(i) Donna is using a colourless solution 'A' to identify the cation and anion present in samples 'X' and 'Y' respectively. The experiment performed by her is given below. Using the given information, identify the cation and anion in the mixtures.

[2]



(ii) Classify the following as oxidation/ reduction reaction:

[2]



(iii) Give reasons for the following, with respect to the lab preparation of nitric acid:

[3]

(a) All glass is used in the laboratory preparation of nitric acid.

(b) Nitric acid prepared in laboratory is slightly yellow in colour.

(c) Conc.  $\text{H}_2\text{SO}_4$  is used and not conc.  $\text{HCl}$  in the laboratory preparation of nitric acid.

(iv) Bianca works as a quality control supervisor in a chemical production plant that supplies solvents to various industries. She heads two sections, 'A' and 'B' which manufacture two different forms of ethanol. In section 'A,' the alcohol produced has a light blue colored tint and is used for several industrial applications. In section 'B,' the alcohol produced is mainly used as solvent for paints and varnishes.

[3]

(a) Name the two forms of ethanol that are manufactured in the plant.

(b) What is added to ethanol manufactured in section 'A'?

(c) Why is the consumption of ethanol manufactures in section 'B' fatal?



**HIRANANDANI FOUNDATION SCHOOL, POWAI**  
**SECOND PRELIMINARY EXAMINATION, JAN 2026**  
**CHEMISTRY**

STD: X  
DATE: 10/1/2026

MAX. MARKS: 80  
TIME: 2 HOUR

**Instructions to Candidates:**

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.
3. This time is to be spent in reading the question paper.
4. The time given at the head of this Paper is the time allowed for writing the answers.
5. Section A is compulsory. Attempt any four questions from Section B
6. The intended marks for questions or parts of questions are given in brackets [ ].

Number of printed pages:11

**SECTION – A (40 Marks)**  
(Attempt all questions from this Section)

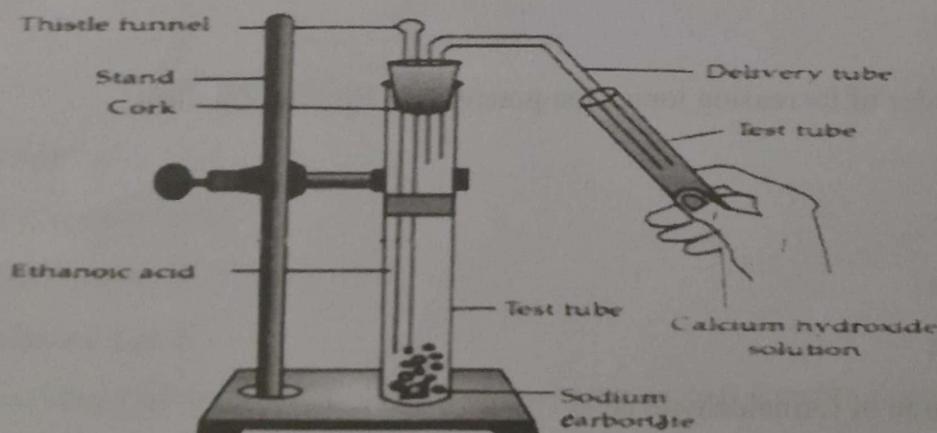
**Question-1**

[15]

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

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

- (i) The gas evolved in the diagrammatic set up given below turns calcium hydroxide solution milky. The gas evolved is:



(a)  $\text{CH}_4$

(b)  $\text{C}_2\text{H}_6$

(c)  $\text{CO}_2$

(d)  $\text{SO}_2$

(ii) A salt solution which gives a reddish-brown precipitate with NaOH and a white precipitate with BaCl<sub>2</sub> solution is:

- (a) CuSO<sub>4</sub>
- (b) Ca (NO<sub>3</sub>)<sub>2</sub>
- (c) Fe<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub>
- (d) FeCl<sub>3</sub>

(iii) Kartik has a list of five elements. He has to select the pair of elements which can make bonds by sharing of electrons. The suitable option for him is:

Elements	Atomic numbers
P	14
Q	12
R	10
S	18
T	16

- (a) P and T
- (b) Q and R
- (c) S and T
- (d) Q and T

(iv) The correct order of increasing ionisation potential of Be, Mg, Ca, Sr is:

- (a) Be < Mg < Ca < Sr
- (b) Ca < Mg < Be < Sr
- (c) Sr < Ca < Mg < Be
- (d) Mg < Ca < Sr < Be

(v) The IUPAC name of formaldehyde is:

- (a) Ethanal
- (b) Acetic acid
- (c) Methanal
- (d) Methanol

(vi) If 2 moles of MO react with 1 mole of oxygen to form 2 moles of gaseous product, the formula of product is

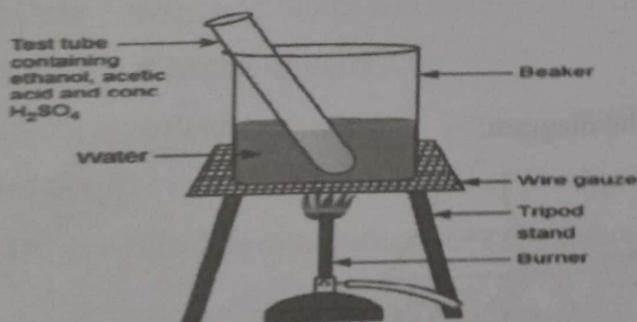
- (a)  $\text{MO}_3$
- (b)  $\text{M}_2\text{O}_3$
- (c)  $\text{MO}_2$
- (d)  $\text{M}_3\text{O}_2$

(vii) **Assertion (A):** In a solution containing equal concentration of  $\text{Cu}^{+2}$  ions and  $\text{Ca}^{+2}$  ions,  $\text{Cu}^{+2}$  ions will be discharged in preference to  $\text{Ca}^{+2}$  ions.

**Reason (R):**  $\text{Ca}^{+2}$  ions are placed above  $\text{Cu}^{+2}$  ions in the electrochemical series.

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

(viii) The role of conc. sulphuric acid in the diagram given below:



- (a) Drying agent
- (b) Dehydrating agent
- (c) Volatile acid
- (d) Reducing agent

(ix) The colour of the solution formed when Manganese (IV)oxide is reacted with conc. HCl:

- (a) Bluish green
- (b) Brown
- (c) Black
- (d) Yellow

(x) The type of bonding present in HCl molecule is:

- (a) Ionic bond
- (b) Polar covalent bond
- (c) Non-polar bond
- (d) Double covalent bond

(xi) **Assertion (A):** Hydraulic washing is a method to separate impurities from the ore.

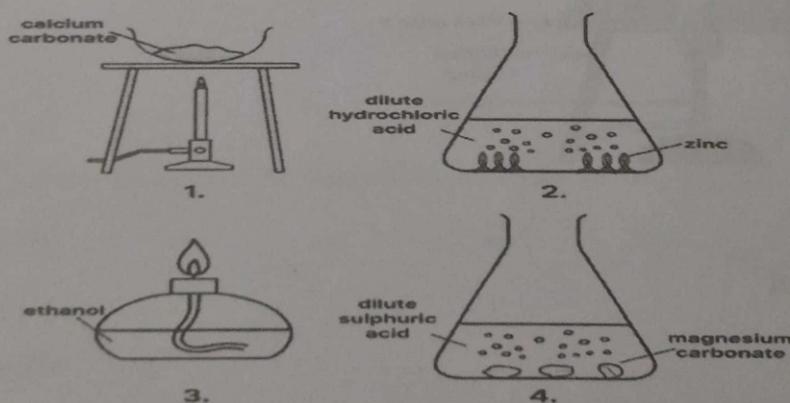
**Reason (R):** In Hydraulic washing, denser particles float and lighter particles settle down.

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

(xii) The most suitable method to prepare sodium nitrate from caustic soda is:

- (a) Double decomposition
- (b) Displacement
- (c) Precipitation
- (d) Neutralisation

(xiii) Four reactions are shown below in the diagram:



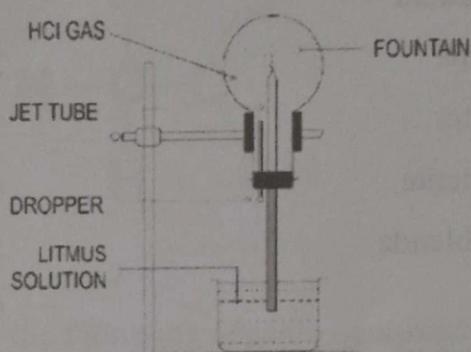
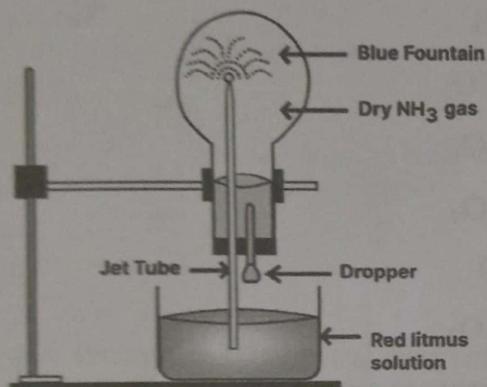
Which reactions produce water?

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

(xiv) Ammonia reacts with excess of chlorine to give:

- (a)  $\text{NCl}_5$
- (b)  $\text{NCl}_3$
- (c)  $\text{NH}_4\text{Cl}$
- (d)  $\text{N}_2\text{O}$

(xv) The purpose of the given experiment is to demonstrate:

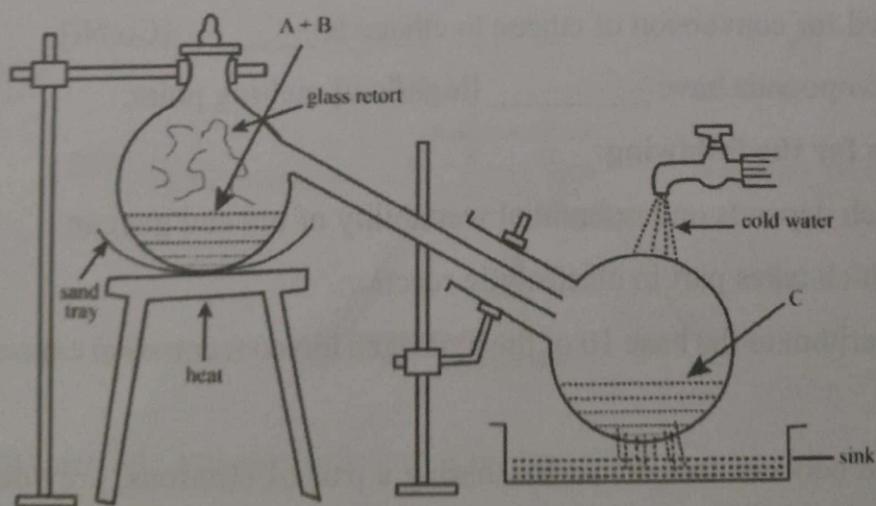


- (a) High solubility of ammonia gas and hydrogen chloride gas in water
- (b) Basic nature of ammonia and acidic nature of HCl
- (c) Density of ammonia and HCl
- (d) Both are colourless gases

**Question-2**

(i) Observe the diagram and answer the following questions:

[5]



(a) Name A, B, C.

(b) Write a balanced chemical equation for the above preparation.

(c) Write the balanced chemical equation for decomposition of C.

(d) State two reasons to avoid high temperature for the above method of preparation of C.

(ii) Match the column A with Column B:

[5]

Column A	Column B
(a) Corundum	1. ZnS
(b) Siderite	2. ZnCO <sub>3</sub>
(c) Zincite	3. Al <sub>2</sub> O <sub>3</sub>
(d) Magnetite	4. Fe <sub>3</sub> O <sub>4</sub>
(e) Zinc blende	5. ZnO
	6. FeCO <sub>3</sub>

(iii) Complete the following sentence by choosing the correct answer from the brackets:

[5]

(a) The product at anode during electrolysis of dil. copper sulphate solution using platinum electrode is \_\_\_\_\_. [oxygen/copper]

(b) If relative molecular mass of butane is 58, then its vapour density is \_\_\_\_\_. [32/29]

(c) The compound \_\_\_\_\_ [FeSO<sub>4</sub>.NO/FeSO<sub>4</sub>.NO<sub>2</sub>] is formed as a brown ring for identification of nitrate radical.

(d) The catalyst used for conversion of ethene to ethane is \_\_\_\_\_. [Co/Ni]

(e) Electrovalent compounds have \_\_\_\_\_ [high/low] melting point.

(iv) State the terms for the following:

[5]

(a) The process which depends on preferential wettability of ore and gangue.

(b) The electrode which takes part in electrolytic reaction.

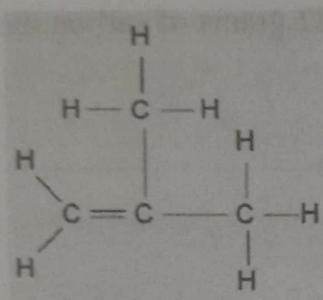
(c) The negative logarithm to the base 10 of the hydrogen ion concentration expressed in moles per litre.

(d) The bond formed between two atoms by sharing a pair of electrons, provided entirely by one of the combining atoms but shared by both.

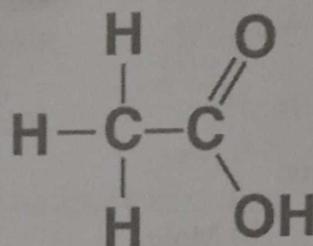
(e) An atom or group of atoms joined in a specific manner which is responsible for the characteristics chemical properties of organic compounds.

(v)

(a) Give the IUPAC names of the organic compounds represented by the structural formulae given below: [2]



1



2

(b) Draw the structural diagram for the following organic compounds: [3]

1. Methane

2. Carbon tetrachloride

3. Benzene

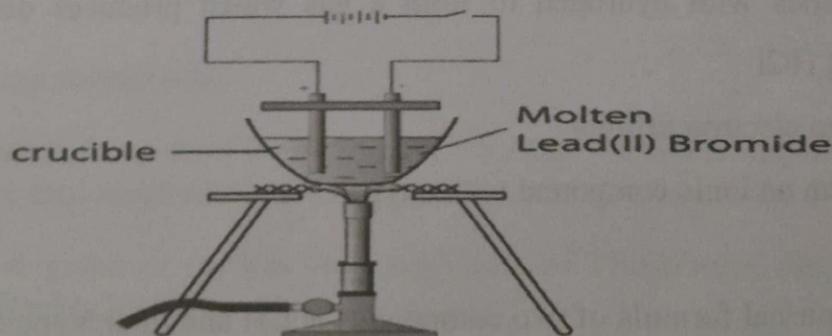
SECTION – B (40 Marks)

(Attempt any four questions from this Section)

Question-3

(i) A student puts his signature with graphite pencil. If the mass of carbon in the signature is  $10^{-12}$ g, calculate the number of carbon atoms in the signature. [2]

(ii) The diagram given below describes electrolysis of molten lead bromide. [4]



(a) Name the crucible and electrodes used for this process.

(b) Write the reactions at the cathode and anode.

- (c) State the observation at respective electrodes.  
 (d) Name the product formed at cathode and anode.

**(iii) Give one significant observation when:** [2]

- (a) Chlorine gas reacts with excess of ammonia.  
 (b) Potassium chloride is dipped in conc. HCl and heated in non-luminous flame.

**(iv) Calculate the ratio between the volumes occupied by 22 grams of carbon dioxide and 10 grams of hydrogen gas.** [2]

**Question-4**

**(i) Define the following terms:** [2]

- (a) Homologous series                      (b) Mole

**(ii) Draw the electron dot structure of:** [2]

- (a) Hydroxyl ion  
 (b) Nitrogen molecule

**(iii) Give balanced chemical equations for the following conversions.** [3]

- (a) Ethyl chloride to Ethyl alcohol  
 (b) Sodium sulphide to Hydrogen sulphide  
 (c) Iron to Iron (III)chloride

**(iv) L, M and N are three elements with atomic numbers 13, 7 and 10 respectively.**

**Name the element:** [3]

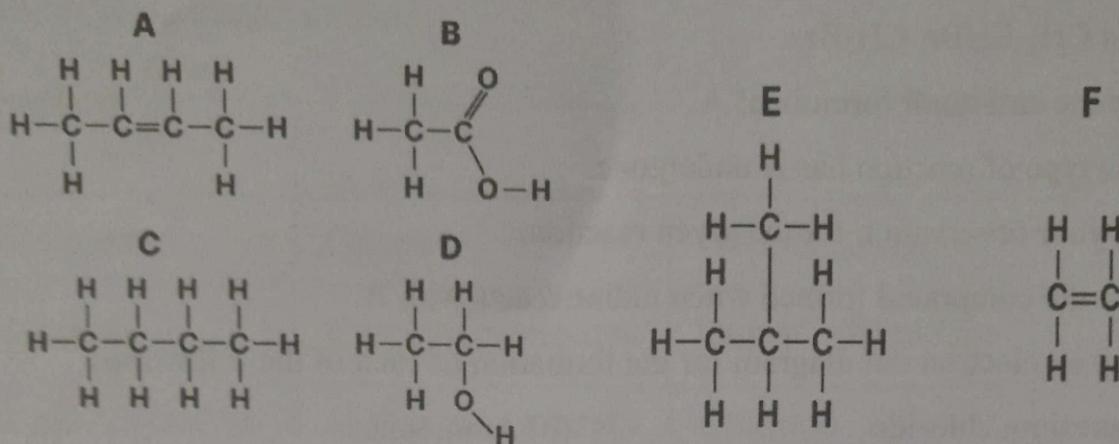
- (a) It combines with hydrogen to form a gas which produces dense white fumes with concentrated HCl  
 (b) It has zero electron affinity  
 (c) It can form an ionic compound with oxygen.

**Question-5**

**(i) If the empirical formula of two compounds is CH and their Vapour densities are 13 <sup>and</sup> 39 respectively, find their molecular formula. [C=12, H=1]** [3]

(ii) The structures of six organic compounds are shown:

[2]



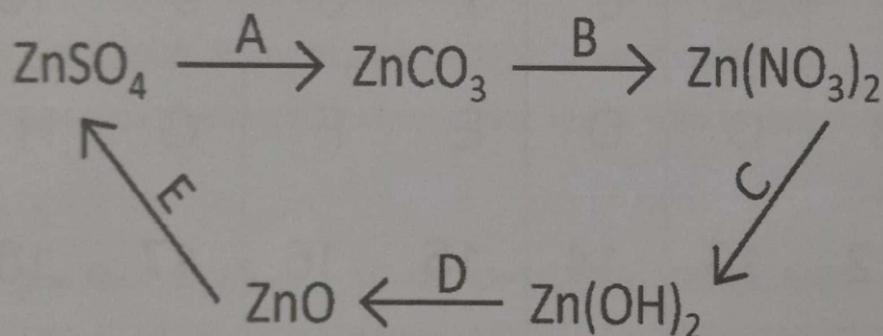
Answer the following questions based on above structures.

(a) Identify two of the compounds which are not isomers of each other.

(b) Give a balanced chemical equation for a conversion from D to F

(iii) Give balanced chemical equations for the conversions from A to E.

[5]



### Question-6

(i) Solve the following numerical:

[2]

(a) 112 mL of a gaseous fluoride of a non-metal Phosphorus at S.T.P. has a mass of 0.63 g. Calculate the relative molecular mass of the fluoride.

(b) If this compound given in (a) has only one atom of Phosphorus, then determine its molecular formula. [P=31, F=19]

(ii) Give reasons:

[2]

(a) Aluminium and zinc powder cannot be distinguished by strong alkalis.

(b) Liquid ammonia is used as a refrigerant in ice plants.

(iii) Compound A is bubbled through bromine dissolved in carbon tetrachloride and the product formed is  $\text{CH}_3\text{-CHBr-CH}_2\text{Br}$ . [4]

- (a) Draw the structural formula of A.
- (b) Name type of reaction has A undergone.
- (c) State your observation for the given reaction.
- (d) Name the compound formed when iodine reacts with A.

(iv) Draw an electron dot diagram for the formation of each of the following: [2]

- (a) Magnesium chloride
- (b) Ammonia

### Question-7

(i) The given table refers to the elements of the Periodic Table with atomic numbers from 3 to 18 by letters, which are not the usual symbols of the elements. [5]

3	4	5	6	7	8	9	10
A	B	C	D	E	F	G	H
11	12	13	14	15	16	17	18
I	J	K	L	M	N	O	P

Name the following based on above table:

- (a) The most electronegative element
- (b) Halogen/s
- (c) An alkali metal/s
- (d) An element/s with valency 4
- (e) The element with least atomic size in period 3

(ii) Use the information given in (a) to (e) to identify the substances P to W selecting your answers from the given list. [5]

List		
Calcium	Oxygen	Copper (II) oxide
Carbon	Calcium hydroxide	Copper (II) nitrate
Lead (II) oxide	Hydrogen chloride	Chlorine
Lead (II) nitrate	Calcium oxide	Ammonium chloride

- (a) On adding water to T, heat evolved and R is formed.  
 (b) Q burns brightly in air to form T.  
 (c) When S is heated, it gives off brown fumes and leaves a black residue of U.  
 (d) P is a white solid. When heated produces white fumes.  
 (e) V is a gaseous non-metallic element that reacts with hydrogen to form W.

### Question-8

- (i) Calculate the following: [C=12, O=16, H=1, Cu=64, S=32] [4]
- (a) Cost of Sugar ( $C_{12}H_{22}O_{11}$ ) is ₹40 per kg; calculate its cost per mole.  
 (b) Find the percentage of water of crystallisation in hydrated copper sulphate.
- (ii) Write three balanced chemical equations for purification of bauxite in extraction of Al. [3]
- (iii) Differentiate between the following pairs based on the criteria given: [3]
- (a) Ammonia and Hydrogen sulphide (using Nessler's reagent)  
 (b) Ferrous sulphate and Lead nitrate (Action of ammonium hydroxide)  
 (c) Potassium nitrate and Zinc nitrate (Action of heat)

## Question Paper 6



SRI SRI RAVISHANKAR VIDYA MANDIR, MULUND  
SECOND PRELIMINARY EXAMINATION (2025- 26)  
SUBJECT: CHEMISTRY

STD: X  
DATE: 09/01/2026

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 the 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 CONSIST OF 6 PRINTED PAGES.**

### Section A (40 marks)

(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 answer only)

- (i) Which of the following statement is true?
- Mg has more number of electrons than Ca in its outermost shell
  - Ca has more number of electrons than Mg in its outermost shell
  - Mg has more number of electrons than Ca in its atom
  - Ca has more number of electrons than Mg in its atom
- (ii) Why are the carbon rods replaced continuously, during the extraction of aluminium by Hall Heroult's process?
- It minimizes heat loss by radiation.
  - It enhances the mobility of ions.
  - The carbon anode is consumed.
  - It lowers the fusion point.
- (iii) A lab technician is synthesizing nitric acid and mixes dry potassium nitrate with concentrated sulphuric acid in a distillation setup, heating the mixture above 200°C to ensure complete reaction for maximum yield. Which solid salt remains in the distillation flask after the nitric acid has vaporized and been collected?
- $K_2SO_4$
  - $K_2SO_3$
  - $KHSO_4$
  - $KHSO_3$
- (iii) Which two elements react together to form an ionic compound?

Element	W	X	Y	Z
Electronic structure	2,4	2,8	2,8,1	2,8,7

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

(v) How many moles are present in 10g of  $CaCO_3$ ?

[Atomic weight Ca = 40, C = 12, O = 16]

- (a) 10 moles      (b) 1 mole      (c) 0.1 mole      (d) 0.12 mole

(vi) A substance X has following properties

- Has low melting point
- A homogeneous mixture of lead and tin
- Used in electrical fuse

What is X?

- (a) Bronze      (b) Solder      (c) Stainless steel      (d) Brass

(vii) Assertion (A): Sulphuric acid is a dibasic acid.

Reason (R): Sulphuric acid has two replaceable hydrogen atoms per molecule.

Choose which of the following is correct?

- (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.

(viii) A student is given two colorless aqueous solutions, Solution A and Solution B. They are told one is an acid and the other is a base. The student needs to determine which statements regarding the properties of these solutions are correct based on the pH scale. The available options are:

- (1) Higher the pH, stronger the acid (2) Higher the pH, weaker the acid  
 (3) Lower the pH, stronger the base (4) Lower the pH, weaker the base

Which of these statements is/are correct for Solution A (acid) and Solution B (base)?

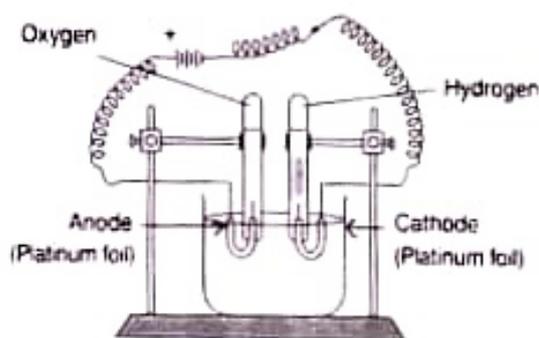
- (a) (1) and (3) (b) (2) and (3) (c) (2) and (4) (d) (1) and (4)

(ix) Assertion (A): n-butane and iso-butane are examples of isomers.

Reason (R): Isomerism is possible only with hydrocarbons having three or more than three carbon atoms.

- (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.

(x) The below diagram represents the electrolysis of acidulated water. Which reaction occurs at the anode?



- (a)  $\text{H}_2\text{SO}_4 \rightarrow 2\text{H}^+ + \text{SO}_4^{2-}$   
 (b)  $\text{H}_2\text{O} \rightarrow \text{H}^+ + \text{OH}^-$   
 (c)  $\text{H}^+ + \text{e}^- \rightarrow \text{H}$ ,  $2[\text{H}] + 2[\text{H}] \rightarrow \text{H}_2$   
 (d)  $\text{OH}^- - \text{e}^- \rightarrow \text{OH}$ ,  
 $[4\text{OH}] \rightarrow 2\text{H}_2\text{O} + \text{O}_2$

(xi) Which of the following arrangement is incorrect as per the property stated against it?

- (a)  $\text{Be} > \text{C} > \text{N} > \text{F}$  (Atomic size) (b)  $\text{I} > \text{Br} > \text{Cl} > \text{F}$  (Atomic size)  
 (c)  $\text{Cl} > \text{Si} > \text{Na} > \text{P}$  (Ionization Energy) (d)  $\text{F} > \text{O} > \text{B} > \text{Be}$  (Electronegativity)

(xii) Element 'P' has electronic configuration 2,8,8,1 and forms compound with chlorine. What will be the number of chlorine atoms in the chloride of 'P'?

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



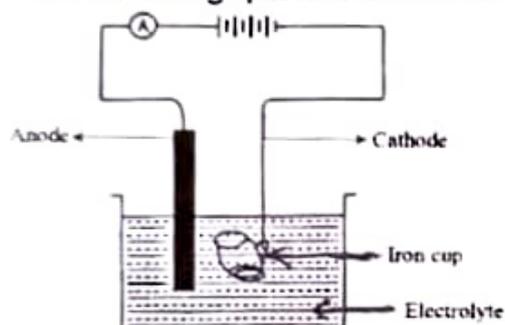
- (e) (i) Calculate the mass of pure iron in 10 kg of ferric oxide of 40% purity [Fe = 56] [2]
- (ii) Draw an electron dot structure to show the formation of calcium oxide molecule [2]
- (iii) Differentiate between electrovalent and covalent compounds on the basis of their solubility. [1]

## SECTION B

(Attempt any four questions from this Section)

### Question 3

- (a) State one relevant reason for the following: [2]
- Ammonia is used to remove grease or oil stains from the clothes.
  - Conc. nitric acid appears yellow when left in a glass bottle.
- (b) The following diagram shows the electroplating of an iron cup with Nickel. Answer the following questions with reference to the diagram. [3]

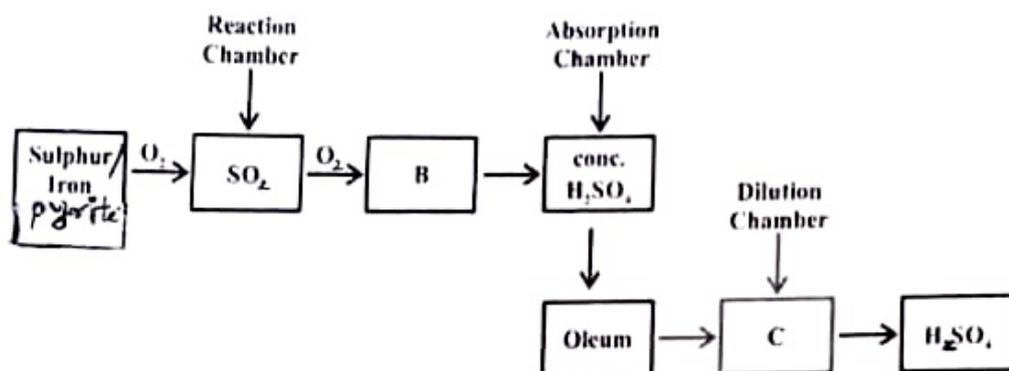


- Write the ions that are formed in the electrolyte
  - During electroplating the iron cup is placed at the cathode. Why?
  - What change would you observe at the anode?
- (c) A student is performing an electrolysis experiment in the school laboratory. She takes an aqueous solution that contains magnesium ions ( $Mg^{2+}$ ), iron (II) ions ( $Fe^{2+}$ ), and copper (II) ions ( $Cu^{2+}$ ). She dips two inert electrodes into the solution and passes an electric current through it. Based on the reactivity of the metals and their tendency to gain electrons: [2]
- Which ion will be discharged first at the cathode?  
Explain why this ion is discharged first.
  - Write the equation for the cathode reaction.
- (d) (i) State Avogadro's Law. [1]
- (ii) During a chemistry lab activity, a student is asked to compare the number of molecules present in different gas samples. In one container, there are 14 g of nitrogen gas ( $N_2$ ). In another container, there are 8 g of oxygen gas ( $O_2$ ). [2]
- Calculate the number of molecules present in 14 g of nitrogen gas
  - Calculate the number of molecules present in 8 g of oxygen gas

### Question 4

- (a) Calculate the volume of oxygen required for the complete combustion of 8.8 g of propane ( $C_3H_8$ ) (Atomic mass H = 1, C = 12, O = 16) [2]
- (b) State scientific reasons for each of the following statements [2]
- Alkenes are known as olefins
  - In catalytic oxidation of ammonia, the platinum continues to glow even after the heating discontinued

- (c) In a sulphuric acid plant operated by chemist Dr. Priya Sharma, she observes a diagram of the roasting process where iron pyrites ( $\text{FeS}_2$ ) ore reacts with oxygen to form ferric oxide and sulphur dioxide gas, which undergoes further conversion. Observe the given figure and answer the questions that follows: [3]



- (i) Balance the chemical equation given below:  
 $\text{FeS}_2 + \text{O}_2 \rightarrow \text{Fe}_2\text{O}_3 + \text{SO}_2$
- (ii) Write balanced chemical equation for formation of 'B'.
- (iii) What would Dr. Priya identify 'C' as? Write a balanced equation for the reaction between Oleum and 'C'.
- (d) State one relevant observation for each of the following reactions. [3]
- Ammonium hydroxide solution is added to a solution of copper sulphate.
  - Addition of ethyl alcohol to vinegar in presence of conc. Sulphuric acid.
  - Ammonia gas is passed over heated lead(II)oxide.

### Question 5

- (a) Smith wrote the following statements incorrectly. Insert a word to correct the statements. [3]
- Lead bromide conducts electricity.
  - Copper reacts with nitric acid to form nitrogen dioxide gas.
  - Bromoethane reacts with sodium hydroxide to produce ethanol and sodium bromide.
- (b) In the formation of the compound  $\text{XY}_2$ , atom X gives one electron to each Y atom, what is the nature of bond in  $\text{XY}_2$ . Draw an electron dot structure for the same. [2]
- (c) Match the salts in Column A with the most suitable method of preparation in Column B. Also, write the balanced equation. [3]

Column A	Column B
(i) $\text{ZnCl}_2$ - from Zn	1. Precipitation reaction
(ii) $\text{KNO}_3$ from $\text{KOH}$ ;	2. Direct combination reaction
(iii) $\text{CaCO}_3$ from $\text{CaCl}_2$	3. Displacement reaction
	4. Neutralization reaction

- (d) Harsh performed the following experiments in the laboratory. State one significant observation made by Harsh when: [2]
- he added concentrated sulphuric acid to blue vitriol.
  - he burnt ammonia gas in air.





Class	Subject	Prelim	Marks	Date	Duration	No. of printed pages
X	Chemistry	2	80	09. 01. 2026	2 Hours	6

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.

Attempt all questions from Section I and any four questions from Section II.

Question 1 (MCQ) of Section A is printed on a separate sheet. This sheet must be attached on the top of the answer script.

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

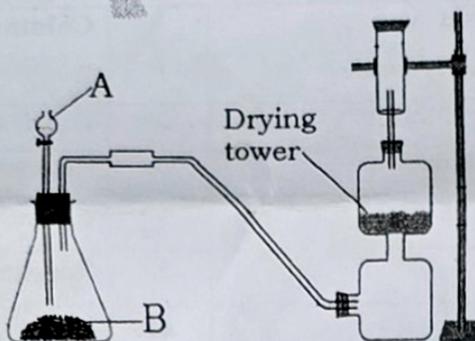
**SECTION – I (40 Marks)**

(Attempt all questions from this section)

**Question 2**

(i) Observe the image given below and answer the questions that follow :

[5]



- If 'B' is a compound of an alkaline earth metal with atomic number 12, then write balanced chemical equation for the preparation of the gas liberated by the reaction between 'A' and 'B'.
- What is the precaution taken during the preparation of the gas?
- State the formula of the drying agent used.
- How is the gas collected?
- Describe the method used to ascertain that the collection jar is full.

(ii) Identify the following :

[5]

- The element that liberates the most amount of energy when it gains an electron.
- The type of salt formed when insufficient amount of alkali is added to sulphuric acid
- The reaction during which 1,2 – dichloroethane is converted into ethyne.
- The nature of solution that causes phenolphthalein to turn pink.
- The bond formed due to one element sharing an electron pair with an electron deficient species.

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

[5]

- Concentration of sulphide ores is done by \_\_\_\_\_. [roasting / froth flotation]
- The paraffin homologous series contains \_\_\_\_\_ [single / double] covalent bond between carbon atoms.
- When copper reacts with cold and dilute nitric acid, \_\_\_\_\_ [nitrogen dioxide / nitric oxide] is formed.
- The alloy used in electrical circuits due its low melting point is \_\_\_\_\_ [brass / solder]
- The type of reaction in which the hydrogen of an alkane is replaced by a halogen is \_\_\_\_\_. [halogenation / substitution]

(iv) Match the following. Present your answer as – (f) – 9 :

[5]

	Column A		Column B
(a)	Ferrous chloride	1.	Double covalent bond
(b)	Ferric chloride	2.	Direct combination
(c)	Acetylene	3.	Two single covalent bond
(d)	Alumina	4.	Simple displacement
(e)	Water	5.	Roasting
		6.	Leaching
		7.	Calcium carbide

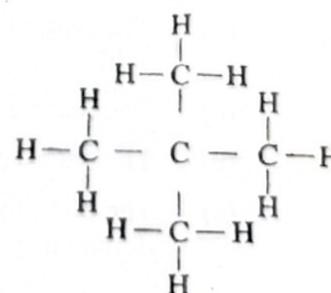
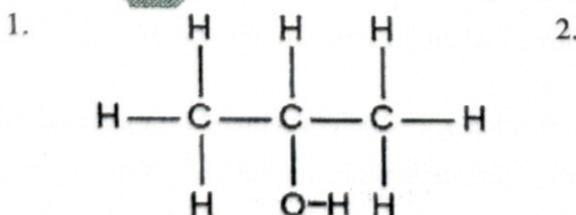
(v) Answer the following questions :

[5]

(a) Draw the complete structural formula of following compounds and circle functional group of each compound.

- Ethylene
- Acetic acid
- Formaldehyde

(b) Write IUPAC name of the following compounds :



**SECTION –II (40 Marks)**  
(Attempt any four questions from this section)

**Question 3**

(i) Answer the following questions :

[3]

- (a) Solutions of compounds like  $\text{NH}_3$  and  $\text{HCl}$  conduct electricity. Explain.
- (b) Arrange the following elements in increasing order of electronegativity :  
 $\text{S, Si, Na, Cl}$
- (c) Ammonia can not be collected over water. Justify the statement.

(ii) Draw all possible isomers of the 3<sup>rd</sup> member of the olefin series.

[3]

(iii) Complete the following reactions with the appropriate reaction conditions. State property exhibited by the second reactant in each case :

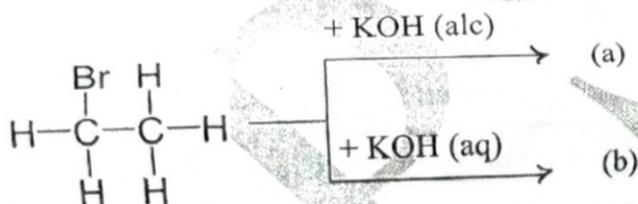
[4]



**Question 4**

(i) Write individual balanced chemical equation for each of the following conditions :

[2]



(ii) Define / state the following terms :

[3]

- (a) Avogadro's law
- (b) Isomers
- (c) Modern periodic law

(iii) Answer the following questions :

[3]

- (a) Draw the electron dot – cross structure for formation of hydronium ion.
- (b) Give one example of a compound that contains all three types of bonds.

(iv) Name the base metal present in each of the following alloys :

[2]

- (a) Stainless steel
- (b) Duralumin

**Question 5**

(i) State one relevant observation for following :

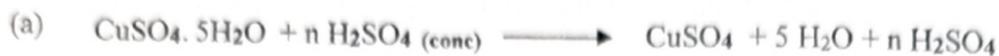
[3]

- (a) Zinc carbonate is heated in a dry test tube.
- (b) Ethene is passed through bromine dissolved in carbon tetrachloride
- (c) A mixture of copper turnings, conc sulphuric acid and potassium nitrate are heated together.

- (ii) Some properties of sulphuric acid are listed below. Choose the property A, B, C or D which is responsible for the reactions (a) to (c) : [3]

A : Typical acid                      B : Dehydrating agent  
C : Oxidizing agent                D : Non – volatile acid

(Write only the relevant alphabet for each equation)



- (iii) Answer the following questions with respect to Hall – Heroult's process : [2]

- (a) What is the role of Cryolite?  
(b) Why are multiple anodes used during the process?

- (iv) Differentiate between the following pair of compounds using a suitable chemical reagent : [2]

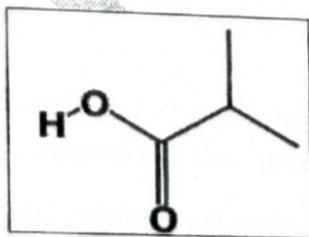
- (a) Ammonia and hydrogen chloride.  
(b) Potassium chloride and sodium chloride.

**Question 6**

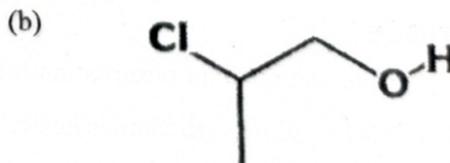
- (i) Write balanced chemical equation for the preparation of the following salts : [2]

- (a) Copper (II) sulphate.  
(b) Lead (II) chloride.

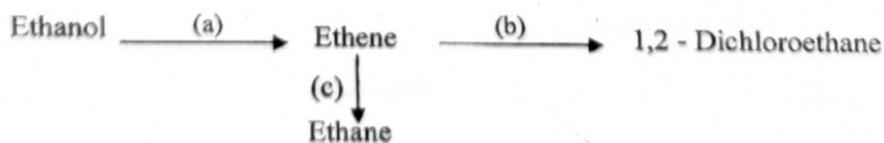
- (ii) If the compound given in the box represents: 2 – Methyl propanoic acid, [2]



then state the IUPAC name of the structures given below :



- (iii) Write balanced chemical equations to bring about the following conversions : [3]



(iv) Calculate :

[3]

the mass and the volume of ethyne gas required, to produce  $8.4 \text{ dm}^3$  of carbon dioxide at STP, given that [RAM of C = 12, H = 1, O = 16] and the equation is as follows :



### Question 7

(i) State any one use of the following substances :

[2]

- (a) Duralumin.
- (b) Liquid ammonia.

(ii) Write an ionic equation for each of the following elements:

[2]

- (a) Element 'A' is a trivalent metal.
- (b) Element 'B' is a divalent non – metal.

(iii) Write the formula of the compound that can be described as :

[3]

- (a) A nitrate which on heating leaves behind no residue.
- (b) The compound formed by trichlorination of methane.
- (c) The complex salt used as electrolyte during electroplating with silver.

(iv) In a round bottom flask, a mixture of ethanol, acetic acid and concentrated sulphuric acid was heated.

[3]

- (a) Write balanced chemical equation for the reaction.
- (b) What is the IUPAC name of the ester formed?
- (c) State one observation for the reaction.

### Question 8

(i) Answer the following questions :

[2]

- (a) State the set up used to prepare liquor ammonia.
- (b) During the preparation of nitric acid in the laboratory, an all glass apparatus is used. Provide suitable reason.

(ii) Write balanced chemical equation for the following reactions :

[2]

- (a) Catalytic oxidation of sulphur dioxide during contact process.
- (b) Preparation of ammonia using Habers process

(iii) Determine the empirical formula of an organic compound whose composition by mass is 26.24% Oxygen and 4.92% hydrogen.

[3]

- (iv) The section of the periodic table contains certain elements represented by random alphabets. Observe the section of periodic table given below and answer the questions that follow :

[3]

		GROUPS																		
		1	2											13	14	15	16	17	0	
PERIODS	1																			L
	2	Q												E	G	J	Z	M		
	3	R	U												I			N		
	4	T															O			

- State the electronic configuration of 'I'.
- Arrange elements of group 1 in increasing order of atomic radius.
- Identify the element with highest value of electron affinity.



**CHEMISTRY**  
**(Two Hours)**

*Answers to this Paper must be written on a paper.  
The time given at the head of this Paper is the time allowed for writing the answers.  
Attempt all questions from Section I and Section II.*

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

**SECTION – I (40 MARKS)**

*(Attempt All questions from this section)*

**Question 1**

**Choose the correct answers to the questions from the given options:**

**[15]**

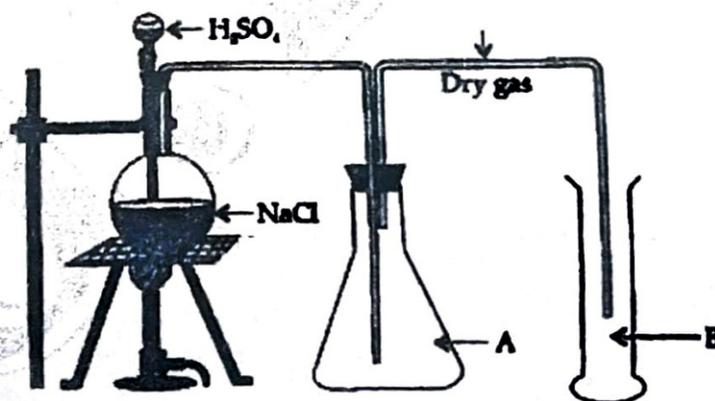
**(Do not copy the questions, write the correct answers only)**

- (i) Two elements X and Y have 2 and 7 valence electrons respectively and they have same number of electron shells. Their electron affinities are:  
(A)  $X = Y$  (B)  $X < Y$   
(C)  $X > Y$  (D)  $Y < X$
- (ii) The cation which gets reduced first during the electrolysis of a solution which contains  $\text{Cu}^{2+}$ ,  $\text{Ag}^{1+}$  and  $\text{H}^{1+}$  of the same concentration.  
(A)  $\text{Cu}^{2+}$  (B)  $\text{Ag}^{1+}$   
(C)  $\text{H}^{1+}$  (D) all of these ions
- (iii) P, Q, R and S are the elements with atomic numbers 6, 11, 16 and 8 respectively. The formula of the compound between Q and S:  
(A) QS (B)  $\text{Q}_2\text{S}$   
(C)  $\text{QS}_2$  (D)  $\text{QS}_3$
- (iv) A molecule of ..... contains three covalent bonds.  
(A) Hydrogen (B) Oxygen  
(C) Ammonia (D) Nitrogen
- (v) The gas which turns Starch iodide paper blue black:  
(A)  $\text{SO}_2$  (B)  $\text{Cl}_2$   
(C)  $\text{NO}_2$  (D)  $\text{SO}_3$
- (vi) The molecular weight of a compound is 90. The empirical formula weight is 30. Then:  
(A)  $n = 1$  (B)  $n = 2$   
(C)  $n = 3$  (D)  $n = 4$
- (vii) The basic gas produced when solid ammonium chloride undergoes thermal decomposition:  
(A) NO (B) HCl  
(C)  $\text{N}_2$  (D)  $\text{NH}_3$
- (viii) Assertion (A): The tendency of losing electrons increases down the group.  
Reason (R): The most reactive metal is placed at the top of Group I.  
(A) Both A and R are true and R is the correct explanation of A  
(B) Both A and R are true and R is not the correct explanation of A  
(C) A is true but R is false  
(D) A is false but R is true

- (ix) An unsaturated hydrocarbon used for welding purposes.  
 (A) Ethyl alcohol (B) Methane  
 (C) Acetylene (D) Acetic acid
- (x) The number of moles present in 10g of  $\text{CaCO}_3$ . [At. wt of Ca=40; C=12; O=16]  
 (A) 10 moles (B) 0.1 mole  
 (C) 1 mole (D) 0.11 mole
- (xi) Assertion (A): Froth floatation is a method of concentration of sulphide ores.  
 Reason (R): In this method the ore is wetted by water and the impurities are wetted by the oil.  
 (A) Both A and R are true and R is the correct explanation of A  
 (B) Both A and R are true and R is not the correct explanation of A  
 (C) A is true but R is false  
 (D) A is false but R is true
- (xii) The electrode reaction at cathode during the electroplating of an article with silver metal using silver salt is:  
 (A)  $\text{Ag} - 1e^- \rightarrow \text{Ag}^{1+}$  (B)  $\text{Ag}^{1+} + 1e^- \rightarrow \text{Ag}$   
 (C)  $\text{Ag} + 1e^- \rightarrow \text{Ag}^{1+}$  (D)  $\text{Ag}^{1+} - 1e^- \rightarrow \text{Ag}$
- (xiii) The formula which represents saturated hydrocarbon is.  
 (A)  $\text{C}_4\text{H}_8$  (B)  $\text{C}_5\text{H}_{12}$   
 (C)  $\text{C}_4\text{H}_6$  (D)  $\text{C}_5\text{H}_{10}$
- (xiv) The main metal present in the alloy Solder is:  
 (A) Copper (B) Zinc  
 (C) Iron (D) Lead
- (xv) The gas that decolourises Potassium permanganate ( $\text{KMnO}_4$ ) solution is:  
 (A) Sulphur dioxide (B) Carbon dioxide  
 (C) Chlorine (D) Ammonia

**Question 2**

- (i) The following questions are pertaining to the laboratory preparation of Hydrogen chloride gas. [5]



- (a) Give the role of substance 'A'?
- (b) Write balanced equation for the reaction that takes place in the round bottom flask.
- (c) Why is the temperature of the reaction mixture kept below  $200^\circ\text{C}$ ?
- (d) State the method of collection of the gas.
- (e) How will you identify the gas after collection?

ICSE ACADEMY (ii) Match the following columns:

[5]

	Column I		Column II
(a)	Contact Process	(i)	Platinum
(b)	Esterification	(ii)	Iron
(c)	Hydrogenation	(iii)	Vanadium Pentoxide
(d)	Ostwald's Process	(iv)	Nickel
(e)	Haber's Process	(v)	Conc. H <sub>2</sub> SO <sub>4</sub>

(iii) Choose the correct answer from the brackets:

[5]

- (a) The gas produced on the action of dil. HCl on metal sulphite is.....  
(SO<sub>2</sub> / SO<sub>3</sub>)
- (b) .....(Silver/ Copper) compounds are easily reduced to corresponding metal by heating alone.
- (c) The molecule which has two lone pair of electrons is .....(NH<sub>3</sub>/H<sub>2</sub>O).
- (d) Dilute HCl and dilute H<sub>2</sub>SO<sub>4</sub> can be distinguished by adding .....  
(NaNO<sub>3</sub> / BaCl<sub>2</sub>) solution.
- (e) Substitution reactions are characteristic reactions of .....(alkenes / alkanes).

(iv) Identify the following:

[5]

- (a) The process of crushing the ore into fine powder.
- (b) The energy released when an electron is added to a neutral gaseous isolated atom to form a negatively charged ion.
- (c) The tendency of an element to form chains of identical atoms.
- (d) The process by which certain ores, specially carbonates, are converted to oxides by heating in the absence of air.
- (e) A type of covalent bond in which electrons are shared equally between the combining atoms.

(v) (a) Give the IUPAC name of the following:

[5]



(b) Draw the structural diagram of the following organic compounds:

- (i) 2-methyl propan-1-ol
- (ii) Acetic acid
- (iii) 2, 3 - dimethyl butane

**SECTION - II (40 MARKS)**

Q 3, Q 4, Q 5, Q 6, Q 8

(Attempt any 4 questions from this section)

o Question 3

(i) Identify the substance underlined:

[2]

- (a) The organic compound which when solidified, forms an ice like mass.
- (b) The electrolyte that is preferred for the electroplating of silver.

(ii) Give one relevant observation when: [2]

- (a) Bromine vapours are passed into a solution of ethyne in carbon tetrachloride.  
 (b) Sodium hydroxide solution added to Iron (II) sulphate solution.

(iii) State the property exhibited by sulphuric acid in each of the following cases: [3]

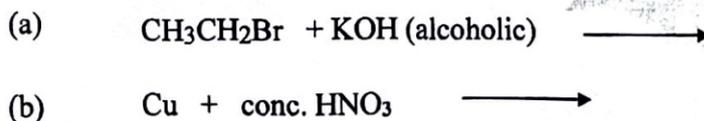
- (a) When sulphur reacts with conc. sulphuric acid to produce SO<sub>2</sub> gas.  
 (b) When conc. sulphuric acid added to glucose to produce a spongy mass of carbon.  
 (c) When dilute sulphuric acid added to copper oxide to form copper sulphate.

(iv) Calculate: [3]

- (a) The percentage composition of phosphorous in the fertilizer super phosphate Ca(H<sub>2</sub>PO<sub>4</sub>)<sub>2</sub>. [At.wt: H=1; P=31; O=16; Ca=40]  
 (b) The Molecular formula of a compound whose empirical formula is CH<sub>2</sub>O and its vapour density is 30. [At.wt: H=1; C=12; O=16]

Question 4

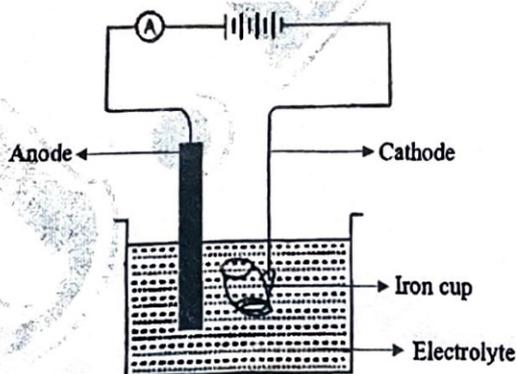
(i) Complete the following reactions with appropriate conditions: [2]



(ii) Differentiate between the following pairs using the criteria given: [2]

- (a) Carbonic acid and Acetic acid (Type of salts formed)  
 (b) Weak electrolyte and Non-electrolyte (Kind of particles present)

(iii) Rohit was trying to electroplate an iron cup with Nickel metal. He has some doubts regarding the electroplating. Help Rohit by answering the following questions: [3]



- (a) Why the iron cup is placed at the cathode?  
 (b) What happens to the anode after sometime?  
 (c) State one condition that is necessary to ensure that the deposit is smooth, firm and even.

(iv) Sheetal mixed two organic compounds and observed a fruity smell when the product is formed. [3]

- (a) Which are the two organic compounds that she would have mixed?  
 (b) State the name of the above reaction.

**Question 5**

(i) Distinguish between the following pair of compounds using the reagent given in the bracket: (No chemical equation needed) [2]

- o (a) Dil. hydrochloric acid and dil. sulphuric acid (using Lead nitrate solution)
- o (b) Lead nitrate solution and zinc sulphate solution (using Ammonium hydroxide solution)

(ii) Identify the gas evolved during the given reactions: [2]

- o (a) Sulphur when treated with conc. nitric acid.
- o (b) Ammonia reacts with heated copper oxide.

(iii) In the above table, H does not represent hydrogen. Some elements are given in their own symbol and position in the periodic table while others are shown with a letter. Answer the following questions using only the letters in the Periodic Table given below to answer the questions that follow: [3]

Group No.	1-IA	2-IIA	13-IIIA	14-IVA	15-VA	16-VIA	17-VIIA	18-0
2 <sup>nd</sup> period	Li		D			O	J	Ne
3 <sup>rd</sup> period	A	Mg	E	Si		H	M	
4 <sup>th</sup> period	R	T	I		Q	U		Y

- o (a) Identify the most electronegative element,
- o (b) Identify the most reactive element of Group I.
- o (c) Identify the element from Period 3 with least atomic size.

(iv) Give balanced equation for the following when [3]

- (a) Ethane is prepared in the laboratory using soda lime.
- (b) Dil. Nitric acid added to copper turnings.
- (c) Warm water added to aluminium nitride.

**Question 6**

(i) Draw the Electron dot (cross dot) structures of the following: [2]

- o (a) Hydronium ion
- o (b) Calcium Oxide

(ii) Give reasons for the following: [2]

- o (a) Electrolysis of molten lead bromide is considered a redox reaction.
- o (b) Ethane undergoes substitution reaction while ethene undergoes addition reaction.

(iii) Complete the following table which relates to the homologous series of hydrocarbon [3]

Homologous series	General formula	Characteristic bond type	IUPAC name of the first member of the series
Alkane	$C_nH_{2n+2}$	(b) .....	Methane
Alkene	(a) .....	double bond	(c) .....

(iv) You are provided with the list of chemicals mentioned below in the box. Select the appropriate compound from the list for the questions that follow: [3]

$Fe(OH)_3$ ,  $AgCl$ ,  $Ca(OH)_2$ ,  $PbCl_2$ ,  $Na_2O$ ,  
 $Fe(OH)_2$ ,  $BaCl_2$ ,  $Pb(OH)_2$ ,

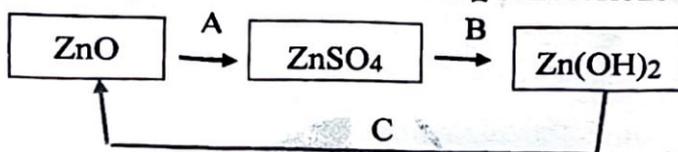
- (a) The compound which dissolves in hot water and not in cold water.
- (b) The compound which dissolves in excess Sodium hydroxide solution.
- (c) The compound which dissolves in Ammonium hydroxide solution.

**Question 7**

- (i) A compound consists of 4.8% carbon and 95.2% bromine by mass. Determine the empirical formula of the compound. [At.Wt: C= 12; Br=80] [2]
- (ii) Define: [2]
  - (a) Electronegativity.
  - (b) Isomerism.
- (iii) Meera is doing an assignment in the extraction of aluminium. Help her to complete the table of Electrolytic reduction of fused alumina to aluminium. [3]

Name of the process	Electrolyte used	Electrode reaction at the anode	Electrodes used	Output
(a).....	Fused alumina, cryolite and flourspar	(b).....	(c).....	Aluminium

- (iv) Write balanced equation for the following conversions (A to C) [3]



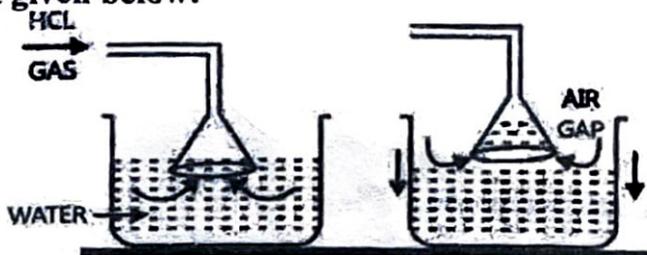
**Question 8**

- (i) The pH values of three solutions A, B and C are given in the table. Observe the table and answer the questions that follow: [2]

Solution	pH value
A	13
B	2
C	7.5

- (a) Which solution will liberate ammonia gas when treated with ammonium sulphate?
- (b) Which solution will liberate H<sub>2</sub>S gas when treated with sodium sulphide?

- (ii) Hydrochloric acid is prepared by dissolving hydrogen chloride in water as per the arrangement given below: [2]



- (a) What is the above arrangement called as?
- (b) What precaution needs to be taken during the above method of preparation of hydrochloric acid?

(iii) Ananya takes a white powdered salt W in a test tube. On heating it produces a buff yellow residue. She dissolves W in water and divides the solution into two parts. To one part she adds Magnesium and to the other part of the solution she adds sodium sulphate solution. [3]

- (a) Identify the compound 'W'
- (b) Name the salt obtained when Magnesium is added to 'W'.
- (c) Write the formula of the precipitate obtained when W is treated with sodium sulphate solution.

(iv) Name the method used for the preparation of the following salts from the list given below. [3]

- Simple displacement - P
- Neutralisation - Q
- Neutralisation-Titration - R
- Precipitation - S

- (a) Ammonium sulphate
- (b) Lead carbonate
- (c) Copper (II) chloride

SECTION A (40 MARKS)

1. Choose the correct answers to the questions from the given options: [15]
- i) When compound R reacts with dilute HCl, it releases a gas that has rotten egg odour and turns acidified  $KMnO_4$  solution pink to colorless. Identify the compound R:
 

a) Copper Nitrate	b) Copper Sulphate
c) Sodium Sulphide.	d) Potassium Sulphite
  - ii) Which one of the following will not produce an acid when made to react with water:
 

a) $CO$	b) $CO_2$	c) $NO_2$	d) $SO_3$
---------	-----------	-----------	-----------
  - iii) The vapour density of  $CH_3OH$  is: [C = 12, H = 1, O = 16]

a) 32	b) 18	c) 16	d) 34
-------	-------	-------	-------
  - iv) The acid which doesn't form an acid salt by a basic radical:
 

a) $H_2CO_3$	b) $H_2SO_3$	c) $H_2SO_4$	d) $CH_3COOH$
--------------	--------------	--------------	---------------
  - v) A salt formed by incomplete neutralization of an acid by a base:
 

a) Basic Salt	b) Acid Salt	c) Normal Salt	d) Complex Salt
---------------	--------------	----------------	-----------------
  - vi) If the empirical mass of the formula  $XY_2$  is 10 and the relative molecular mass is 30, then the molecular formula will be:
 

a) $XY_2$	b) $X_2Y$	c) $X_3Y_3$	d) $X_3Y_6$
-----------	-----------	-------------	-------------
  - vii) A student added excess of NaOH solution to each of the salt solutions listed below. An insoluble ppt formed, identify the salt solution:
 

a) Calcium Nitrate	b) Lead Nitrate	c) Zinc Nitrate	d) Sodium Nitrate
--------------------	-----------------	-----------------	-------------------
  - viii) If an organic compound has molecular formula  $C_{12}H_{22}$  it will be an:
 

a) Alkane	b) Alkene	c) Alkyne	d) Not a hydrocarbon
-----------	-----------	-----------	----------------------
  - ix) A golden yellow flame is produced due to the presence of \_\_\_\_\_ in a salt.
 

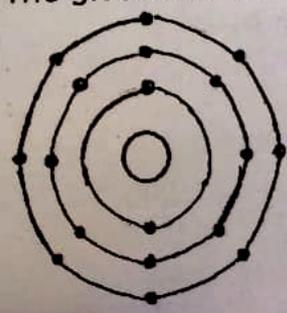
a) Na	b) $Na^+$	c) K	d) $K^+$
-------	-----------	------	----------
  - x) Which of the following will dissociate in aq. solution to give a positive ion other than  $H_3O^+$  and a negative ion other than  $OH^-$  ion:
 

a) $MgCO_3$	b) KOH	c) $CH_3COOH$	d) $NaHCO_3$
-------------	--------	---------------	--------------
  - xi) Solution 'A' reacts with an acid 'B' to give white ppt 'C' which is soluble in excess of  $NH_4OH$ . Identify A, B & C:
 

a) $Mg(NO_3)_2, H_2SO_4, MgSO_4$	b) $Pb(NO_3)_2, HCl, PbCl_2$
c) $Cu(NO_3)_2, H_2SO_4, CuSO_4$	d) $AgNO_3, HCl, AgCl$
  - xii) In homologous series, the molecular weight of two adjacent members differ by:
 

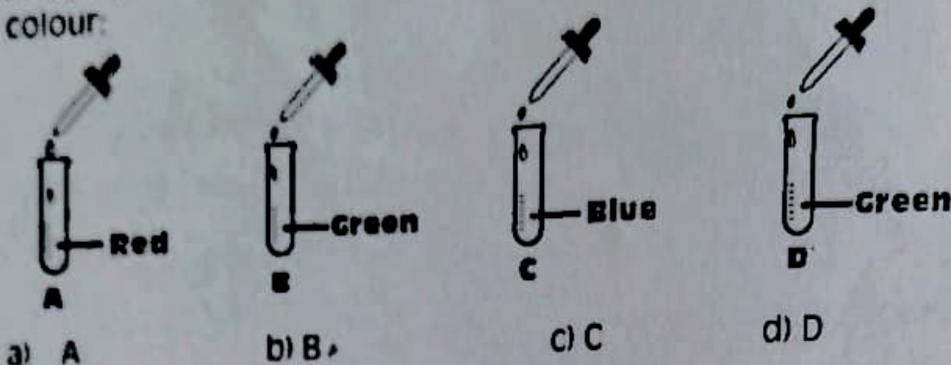
a) 14	b) 12	c) 16	d) 10
-------	-------	-------	-------
  - xiii) The given orbital diagram belongs to the element positioned in:
 

a) period 2, group 2	b) period 3, group 18
c) period 3, group 10	d) period 2, group 14



- xiv) Which of the following would weigh most:
- 1 mole of  $H_2O$
  - 1 mole of  $NH_3$
  - 1 mole of  $CO_2$
  - 1 mole of  $CO$

xv) A few drops of universal indicator are added to four solutions A, B, C & D having pH 2, 10, 9 and 7. Which of the following test tube is labelled with incorrect colour:



2. i) Complete the following by choosing the correct answers from the brackets: [5]
- If an element has one electron in the outer most shell, then it is likely to have \_\_\_\_\_ [smallest/largest] atomic size amongst all the element the same period.
  - Acetic acid will have a \_\_\_\_\_ [higher / lower] pH value than hydrochloric acid at the same concentration.
  - Saturated hydrocarbons do not undergo \_\_\_\_\_ [substitution/addition] reaction
  - A salt formed by complete neutralization of an acid by a base is called \_\_\_\_\_ [acid salt / normal salt]
  - The most electronegative element in period 3 is \_\_\_\_\_. [F/Cl]

ii) Match the following columns: [5]

**Column A**

- water
- Alkali metal
- Halogen
- Calcium oxide
- Weak acid

**Column B**

- Lithium
- Ionic compound
- Covalent Compound
- Acetic Acid
- Iodine
- Sulphuric acid

iii) Identify the following terms: [5]

- The group obtained by removing one of hydrogen atom from the parent alkane *alkyl*
- The amount of substance which contains the same no. Units as the number of atoms in Carbon-12. *mole*
- A substance that conducts electricity in molten or aq. state. *electrolyte*
- The saturated hydrocarbons having general formula  $C_nH_{2n+2}$  *alkane*
- The energy required to remove an electron from a neutral gaseous atom. *I.E*

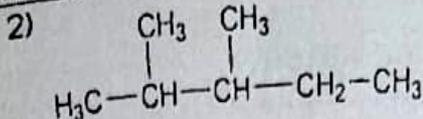
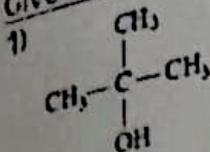
iv) Solution R has a pH of 13 & S has a pH of 2 and T has a pH of 6. [5]

Which solution:

- will liberate ammonia from  $(NH_4)_2SO_4$  on heating R
- is a strong acid S
- contains molecules as well as ions T
- will liberate  $CO_2$ , from  $Na_2CO_3$  S
- How would you increase the pH of solution T? *adding base*

- v) a) Draw structure of the following organic compounds:  
 1) An isomer of but-2-ene  
 2) Pentan-2-ol  
 3) Propanal

- b) Give the IUPAC name of the following:



**SECTION B [40 MARKS]**

(Attempt any 4 questions from this section)

3. i) Correct the following statements and rewrite: [3]
- A polar covalent bond forms when shared pair of electrons are distributed between two atoms.
  - A greenish yellow gas is evolved when  $\text{MnO}_2$  reacts with hydrochloric acid.
  - Cations move towards cathode and deposit at anode.

- ii) Identify the salt based on the given observation: [3]

- Salt solution of A gives a white ppt with  $\text{NH}_4\text{OH}$  which is soluble excess of  $\text{NH}_4\text{OH}$  and forms a white ppt with  $\text{BaCl}_2$  solution.
- Salt solution of B gives dirty green ppt with  $\text{NH}_4\text{OH}$  and forms a white ppt when dissolves in  $\text{AgNO}_3$  solution.
- When salt B reacts with dil. acid a gas with rotten egg odour evolves, and when salt B is introduced to the flame it produces Bluish green flame.

- iii) a) What is the special feature of the apparatus used in lab preparation of  $\text{HNO}_3$ ? [2]
- b) Why should the temperature of the reaction mixture I for preparation of  $\text{HNO}_3$  not be allowed to raise above  $200^\circ\text{C}$ ? [2]

- iv) Name the following organic compounds: [2]
- The first homologue whose general formula is  $\text{C}_n\text{H}_{2n}$ . Ethene
  - The compound with 3 carbon atoms whose functional group is carboxylic acid.

4. i) Identify the reactants X, Y, Z: [Reaction not required] [3]
- Sulphuric acid + X  $\rightarrow$  Oleum
  - Water + Y  $\rightarrow$  ethyne + calcium hydroxide
  - Zinc Oxide + Z  $\rightarrow$  Sodium Zincate + water

- ii) a) The vapor density of a gas is 8. What would be the volume occupied by 24.0 g. of the gas at STP. [3]
- b) Copper metal is a good conductor of electricity but a non-electrolyte, Justify.

- iii) a) Electrical conductivity of carbonic acid is less in comparison to that of dil.  $\text{H}_2\text{SO}_4$ , at a given concentration. Explain why? [2]
- b) Electrolysis of molten bromide is considered as redox reaction.

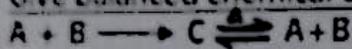
- iv) Draw electron dot diagram of the following underlined compound or ion. [2]

- A positive ion formed when acid dissolve water
- An alkaline gas which forms dense white fumes with conc. HCl

5. a) Give balanced chemical equation for the following:
- Lab preparation of Methane from sodium ethanoate
  - Burning of ammonia
  - Complete combustion of methane

- b) From the equation:  
 $C + 2 H_2SO_4 \longrightarrow CO_2 + 2 H_2O + 2 SO_2$  [C=12, H=1, O=16, S=32]  
 Calculate,
- The mass of carbon oxidized by 49 g of  $H_2SO_4$   
 Molecular mass of  $H_2SO_4 = 98g$
  - The volume of  $SO_2$  measured at STP liberated at the same time.
  - The number of moles of  $SO_2$  produced.

- c) Give balanced chemical equations for the conversions:



A- Basic gas

B- Acidic gas

C- Ammonium salt

- d) Match the conversions in Column A with the suitable method in Column B during extraction of metals.

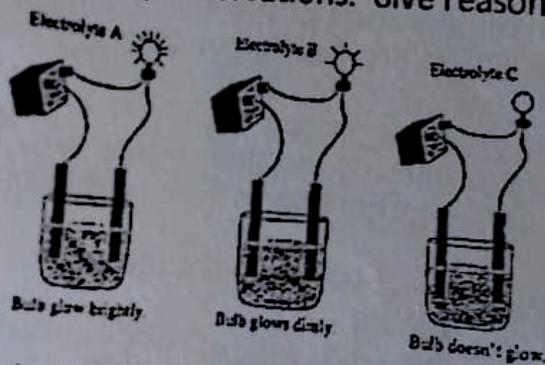
**Column A**

- $FeCO_3 \longrightarrow FeO$
- $Al_2O_3 \longrightarrow Al$
- $HgO \longrightarrow Hg$
- $ZnS \longrightarrow Zn$

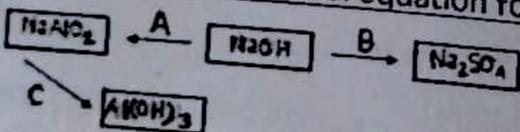
**Column B**

- Reduction - by thermal decomposition
- Reduction - By electrolysis
- By calcination
- By reducing agent
- By roasting

6. i) A group of students conducted an experiment to understand electrolysis. They noted the following observations. Give reason for each of these observations.



- ii) Write balanced chemical equation for the following conversion:



- iii) Give the composition of the following alloys:
- Duralumin
  - Bronze

- iv) Name the gas released when the following are heated.
- Ammonium Nitrate
  - Ammonium Nitrite

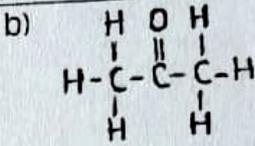
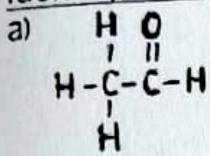
7. i) Name the type of particles present in:
- $NaOH$  solution
  - $CCl_4$
  - $H_2CO_3$

Devika takes a blue crystalline salt **V** in a test tube and heated, salt **V** turns into white amorphous powder **W**. Salt **V** is dissolved in water and divided into two parts. Zinc metal is added to one part of the solution & Barium chloride solution is added to the other part. [3]

- Identify salt **V**.
- State one observation when Zn metal is added to the solution of **V**.
- Write colour of ppt formed when Barium chloride solution is added to solution of **V**.

iii) The empirical formula of an organic compound is an  $C_3H_4N$ . Its molecular weight is 108g. Find the mass of Carbon in one mole of the compound. [2]  
 [C = 12, H = 1, N = 14]

iv) Identify the functional group in the following: [2]



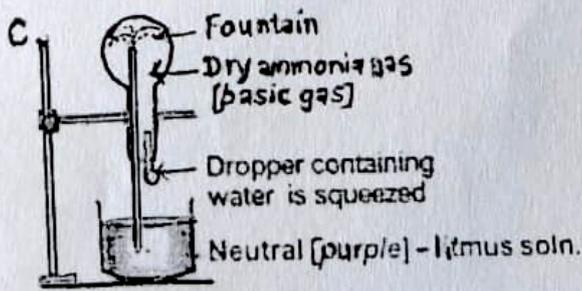
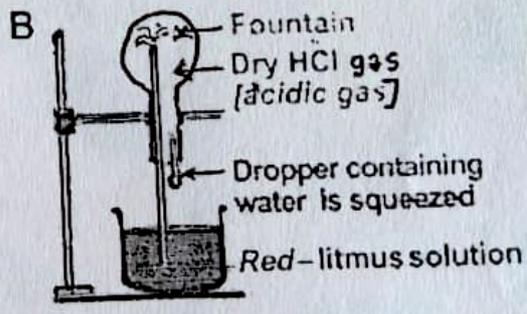
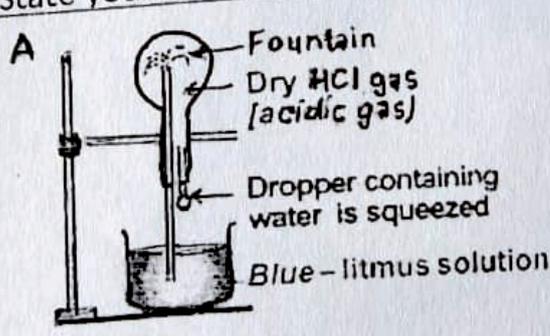
8. i) Robin wants to electroplate his copper keychain with silver. Guide him to get it done by answering the following questions: [3]

- Name the cathode.
- Name the most preferred electrolyte.
- What should be anode made up of?

ii) Select the method of the preparation of the following salts, from the methods given the list. [4]

- Methods: Precipitation, Direct combination, Displacement, Titration,
- Iron (II) sulphate D
  - Iron (III) chloride DC
  - Sodium chloride T
  - Lead chloride P

iii) State your observations for the following: [3]



L. R. & S. M. VISSANJI ACADEMY  
Secondary Section 2025-26  
Second Preliminary Examination  
Subject: Chemistry



Std: 10

Date: 08/01/26

Marks: 80

Time: 2 hours

INSTRUCTIONS:

- 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

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

- (a) Sulphur dioxide (b) Nitrogen dioxide  
(c) Hydrogen chloride (d) Carbon dioxide

(ii) Which formula represents a saturated hydrocarbon?

- (a)  $\text{C}_4\text{H}_8$  (b)  $\text{C}_5\text{H}_{12}$  (c)  $\text{C}_4\text{H}_6$  (d)  $\text{C}_5\text{H}_{10}$

(iii) Assertion (A): Hall Heroult's process is used to get pure aluminium from its oxide.

Reason (R): Aluminium generally is not found in aluminium oxide form.

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

(iv) Which of the following reactions takes place at the anode during the electroplating of an article with silver?

- (a)  $\text{Ag} - 1e^- \rightarrow \text{Ag}^{1+}$  (b)  $\text{Ag} + 1e^- \rightarrow \text{Ag}^{1-}$   
(c)  $\text{Ag} - 1e^- \rightarrow \text{Ag}$  (d) None of the above

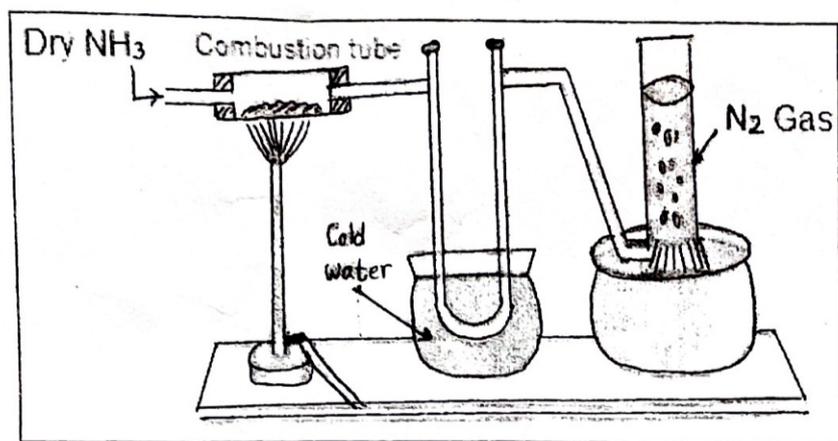
(v) The metal whose oxide can be reduced by reducing agents:

- (a) Copper (b) Sodium (c) Aluminium (d) Potassium

(vi) The nitrate which on thermal decomposition leaves behind a residue which is yellow when hot and white when cold:

- (a) Lead(II)nitrate (b) Ammonium nitrate  
(c) Copper(II)nitrate (d) Zinc nitrate

(vii) Study the diagram and choose the correct option related to the content given below:



Compound X reacts with ammonia in the combustion tube, which leaves a residue Y. Identify X and Y, as well as the property Z of ammonia demonstrated in this particular reaction.

- (a) X= CuO, Y= black, Z = reducing property.  
(b) X= PbO, Y = yellow, Z = oxidising property.  
(c) X= CuO, Y = brown, Z = oxidising property.  
(d) X= PbO, Y= grey, Z = reducing property.

(viii) The drying agent used to dry HCl gas is \_\_\_\_\_.

- (a) Concentrated sulphuric acid (b) Calcium oxide  
(c) Dilute sulphurous acid (d) Calcium hydroxide

(ix) Rudra makes a detailed study on the values of electronegativity and the formation of compounds. Accordingly, he draws the following conclusion:

The larger the electronegativity (EN) difference between the combining atoms, the more ionic bonds will form. If the EN difference is negligible, covalent bonds will form.

So, which of the following values refers to covalent bonds?

- P: 3.0 and 3.0 Q: 0.9 and 3.0  
(a) Only Q (b) Only P (c) Both P and Q (d) Neither P nor Q

- (x) **Anhydrous Iron (III) chloride is prepared by :**
- (a) Direct combination      (b) Simple displacement  
(c) Decomposition          (d) Neutralization

(xi) **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 [-OH], Which of the following stands for the functional group of B?**



(xii) **An acid which has 2 replaceable hydrogen ions:**

- (a) Hydrochloric acid      (b) Phosphoric acid  
(c) Carbonic acid          (d) Acetic acid

(xiii) **If the vapour density of a hydrocarbon is 8, then its RMM will be:**

- (a) 32    (b) 8    (c) 16    (d) 24

(xiv) **Parth reacts copper turnings with cold dilute nitric acid in a test tube. He tests the gas given off with moist red and blue litmus paper. What is the name of the gas that evolved and what is the final colour of the litmus paper?**

Gas	Final colour of the litmus paper
(a) NO	No change in blue and red litmus paper
(b) $NO_2$	Blue litmus turns red and no change in red litmus
(c) $N_2$	No change in blue and red litmus paper
(d) $N_2O$	No change in blue and red litmus paper

(xv) **Which of the following arrangements is INCORRECT as per the property stated against it?**

- (a)  $Li > Be > N > O$       (Metallic character)  
(b)  $Cl > F > Br > I$       (Electron affinity)  
(c)  $O^{2-} > F^- > Mg^{2+} > Na^+$  (Ionic radii)  
(d)  $I > Br > Cl > F$       (Number of shells)

**Question 2**

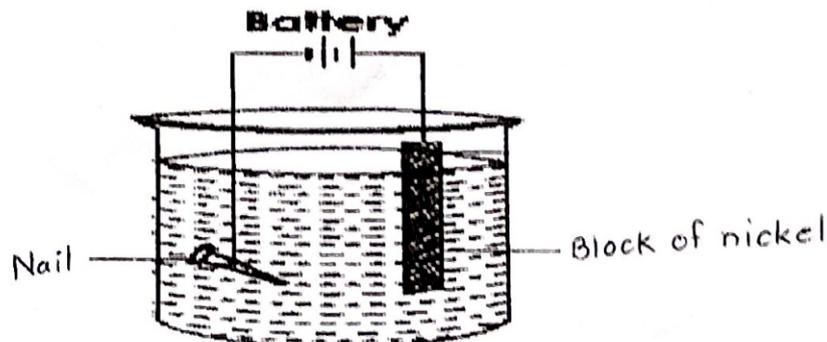
(i) Match the column A with column B:

[5]

	Column A		Column B
(a)	Calamine	(i)	Ammonium nitrate
(b)	Funnel arrangement	(ii)	Ammonium radical
(c)	An explosive	(iii)	Sulphuric acid
(d)	One lone pair present	(iv)	Hydrochloric acid
(e)	Non-volatile acid	(v)	Zinc carbonate
		(vi)	Hydronium radical

(ii) Study the following diagram which is related with electroplating of Nickel and answer the questions.

[5]



- Name the electrolyte used in this process.
- Which is the oxidising electrode? The electrode that is connected to the block of nickel or the one that is connected to the nail to be plated?
- Write the reaction occurring at the electrode where the nail is connected?
- State the conditions ensured (related with current) during this process.
- Identify the two ions which migrate to the anode but neither are discharged.

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

[5]

- Ammonia in the liquified form is \_\_\_\_\_ [neutral / basic]
- An inert electrode used in the electrolysis of acidulated water is \_\_\_\_\_  
[Copper / Platinum]
- Lower the pH value of a solution, the more \_\_\_\_\_ [acidic/alkaline] it is.
- Ionic compounds have \_\_\_\_\_ [Electrostatic/Van der Waal's] force of attraction between them.
- Saturated hydrocarbons are \_\_\_\_\_ [alkanes / alkenes]

(iv) Identify the following:

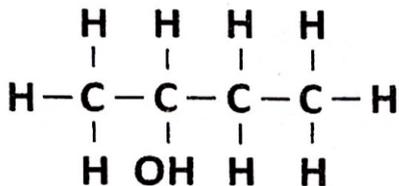
[5]

- The property by which carbon bonds with itself to form a long chain.

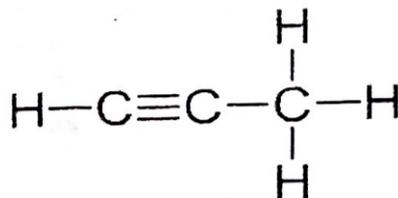
- (b) The chemical name of the principal ore of aluminium.  
 (c) The process of separation of ions present in an ionic compound.  
 (d) A type of salt formed by complete neutralisation of an acid by a base.  
 (e) The amount of substance which contains the same number of units as the number of atoms in 12 g of Carbon -12.

(v) (a) Give the IUPAC name of the following organic compounds: [2]

1.



2.



(b) Draw the structural diagram for the following compounds: [3]

- 1) Ethylene dibromide
- 2) butan -1-al
- 3) Benzene

**SECTION B (40 Marks)**

(Attempt **any four** questions.)

**Question 3**

(i) Give balanced chemical equations for the action of conc. sulphuric acid on each of the following: [2]

- (a) Sulphur (b) Potassium hydrogen carbonate.

(ii) Mention any one use for each of the following- [2]

- (a) Liquid ammonia (b) Brass

(iii) Give scientific reasons: [3]

- (a) Group VII elements are strong non-metals while group I elements are strong metals.
- (b) Pure acetic acid is also known as glacial acetic acid.
- (c) Direct addition of dil.  $\text{H}_2\text{SO}_4$  to  $\text{PbCO}_3$  is an impractical method of preparing lead sulphate.

(iv) Brown ring test is used for the identification of an anion. [3]

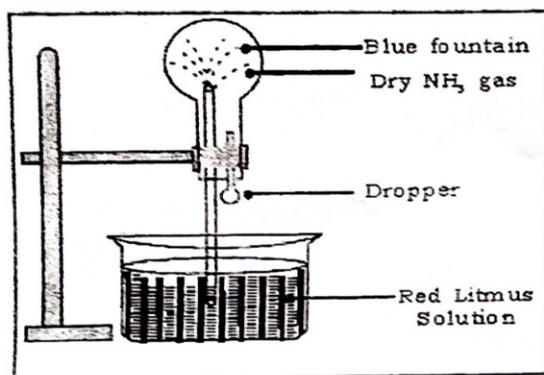
- (a) Why is the freshly prepared Ferrous sulphate solution used in the above test?
- (b) What is the chemical name of the brown ring?
- (c) Which anion is detected by this test?

**Question 4**

**(i) A hydrocarbon decolourises  $\text{KMnO}_4$  solution but does not form any precipitate with ammoniacal  $\text{AgNO}_3$ . Answer the given questions: [4]**

- Is the hydrocarbon saturated or unsaturated ?
- What is the type of bonds between two carbon atoms ? (Number)
- Does the hydrocarbon belong to the alkane, alkene or alkyne family ?
- What will be the change observed on adding a few drops of bromine solution with  $\text{CCl}_4$  in a test tube filled with this hydrocarbon ?

**(ii) Study the diagram given and answer the questions that follow : [3]**



- Name the shown experiment.
- Which property of  $\text{NH}_3$  gas does this experiment demonstrate ?
- What will be the colour of fountain if phenolphthalein is used instead of red litmus solution ?

**(iii) A, B, C and D summarize the properties of sulphuric acid depending on whether it is dilute or concentrated.**

- A = Typical acid property.
- B = Non-volatile acid
- C = Oxidizing agent
- D = Dehydrating agent

**Choose the property (A, B, C or D) depending on which is relevant to each of the following : [3]**

- Preparation of Hydrogen chloride gas.
- Preparation of Copper sulphate from copper oxide.
- Action of conc. Sulphuric acid on carbon.

**Question 5**

**(i) What is the volume occupied by the following gases at S.T.P. - [2]**

- 5 moles of Butane gas
- 8 gm of Hydrogen gas [At. Wt: H=1]

**(ii) The vapour density of a gas is 8. What would be the volume occupied by 24 g of the gas at S.T.P ? [2]**

(iii) Study the information given in the table below and answer the following questions using only the alphabets given in the table. [3]  
(Note- Alphabets do not represent the actual symbols of the elements)

Element	Atomic Number
P	13
Q	7
R	10

- (a) Which element combines with hydrogen to form a basic gas ?  
(b) Name the element ,which has electron affinity zero ?  
(c) Which element forms an ionic compound with chlorine?

(iv) Identify the cations as well as the anions present in the following descriptions(a)and(b), write the balanced chemical equations for(a). [3]

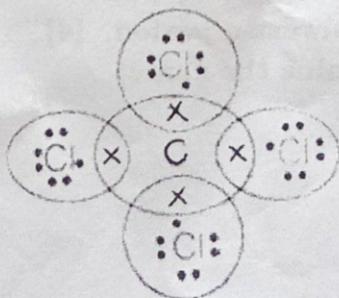
- (a) To salt H, when dilute hydrochloric acid is added, a gas is evolved that has a rotten egg smell and turns lead acetate paper silvery black. Also, the solution obtained above when introduced to the flame of the Bunsen burner produced a brick red-coloured flame.
- (b) Rani was given a salt solution J , to the first part of the salt solution, she added a few drops of ammonium hydroxide and obtained a white precipitate which was soluble in excess. and to the second part of the salt solution, she added a few drops of silver nitrate solution and obtained a white precipitate which was insoluble in dil. nitric acid but soluble in ammonium hydroxide.

### Question 6

(i) In chemistry lab, Teacher instructed Jash to differentiate between HCl acid and HNO<sub>3</sub> acid by adding one solution. [2]

- (a) Which solution he will use ?  
(b) Write his observation for the same.

(ii) Study the diagram given and answer the questions that follow : [4]



- (a) Identify the above compound.  
(b) Which type of bonding present in it.  
(c) Is it polar or nonpolar ? Justify your answer.  
(d) Give IUPAC name of the compound.

**(iii) Choose the correct word which refers to the process of electrolysis from A to E, to match the description (a) to (d):** [4]

A: Oxidation B: Cathode C: Anode D: An electrolyte E: Reduction

- (a) Conducts electricity in aqueous or in molten state.  
 (b) Loss of electron takes place at anode.  
 (c) A reducing electrode.  
 (d) Electrode connected to the positive end or terminal of the battery.

### Question 7

**(i) Identify the alloy in each case from the given composition:** [2]

- (a) aluminium, magnesium, manganese, copper  
 (b) iron, nickel, chromium, carbon.

**(ii) For the practical exam, a solution is provided to Moksh in a test tube. He has to answer the following questions :** [2]

- (a) How to detect the pH of the given solution ?  
 (b) If the pH is 7, how to increase the pH of the given solution?

**(iii) The following questions relate to the extraction of Aluminium by electrolysis.** [3]

- (a) Name the element which serves both as the anode and the cathode.  
 (b) Which solution is used to react with bauxite as a first step in obtaining pure aluminium oxide? Why?  
 (c) Give a balanced chemical equation for the reaction mentioned in the above question b.

**(iv) Identify the gas given out in each of the following:** [3]

- (a) Roasting of Iron pyrite.  
 (b) Dehydration of Ethyl alcohol.  
 (c) Addition of caustic soda solution in zinc granules.

### Question 8

**(i) State the correct answer from the given bracket for changes in properties of elements on moving left to right across a period. [4]**  
**[Increases, Decreases, increase by one and remains the same]**

- (a) Metallic character of elements- \_\_\_\_\_.  
 (b) No. of valence electrons- \_\_\_\_\_.  
 (c) Ionization potential- \_\_\_\_\_.  
 (d) No. of shells - \_\_\_\_\_.

(ii) 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. Work correctly to 1 decimal place. RMM of this compound is 168, what is its molecular formula? [3]  
(At. wt. of H = 1; C = 12; Cl = 35.5)

(iii) (a) Draw the electron dot diagram of a water molecule.  
(b) Define the type of bonding present in it.  
(c) Give one more example of a compound of the same type of bonding. [3]  
[Atomic No.: O = 8 , H = 1]

---

# Scan QR code for Free Access to 500+ Prelim Papers across 20 subjects

