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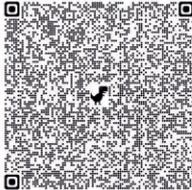
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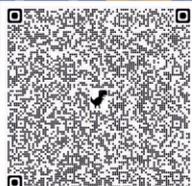
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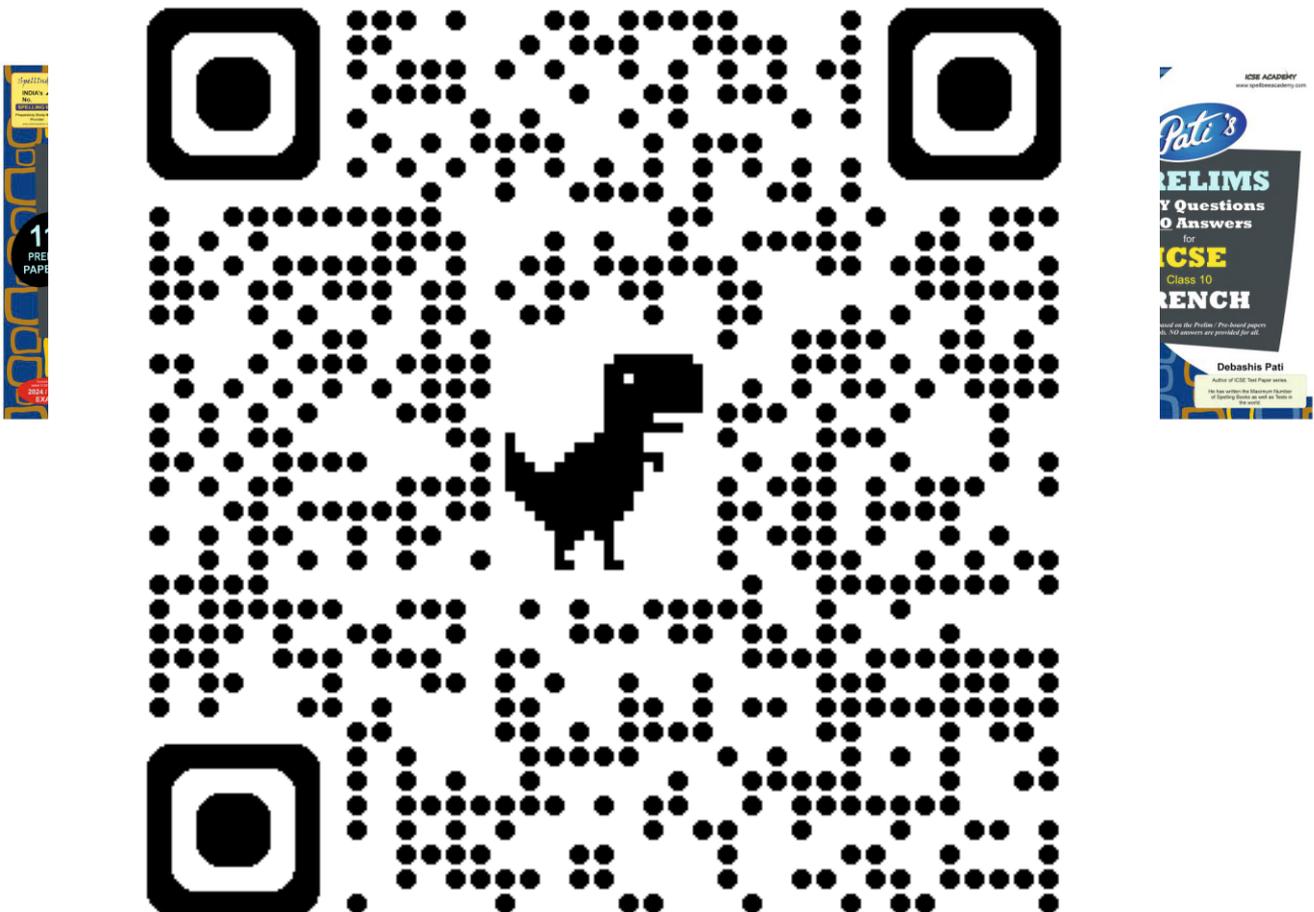
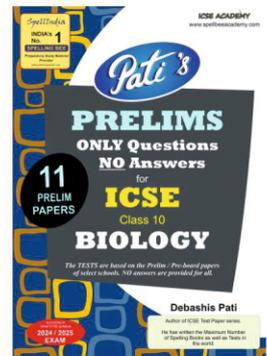
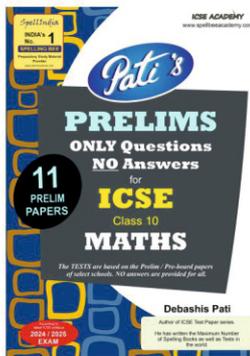
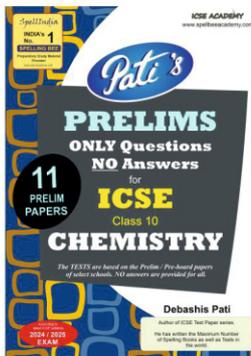
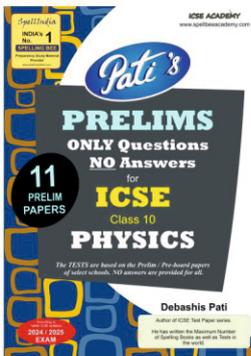
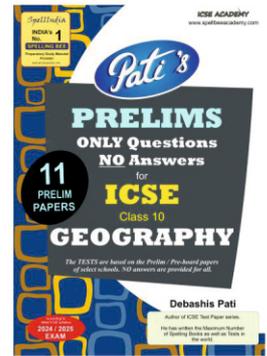
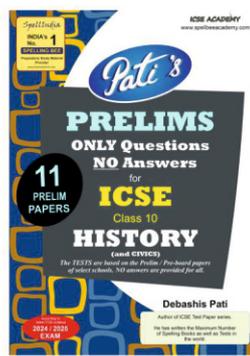
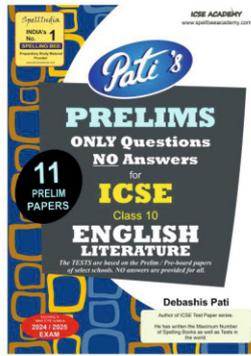
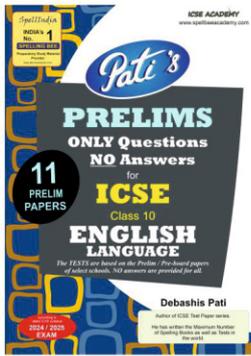
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Set 3b : Question Papers

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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 following one - 3c)

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

Question Paper 11



LOKHANDWALA FOUNDATION SCHOOL
PRELIMINARY EXAMINATION-2025-26
SUBJECT: - CHEMISTRY – SCIENCE PAPER -2

Date :03/01/2026

Grade: 10

Duration: 2 hrs.

Max. Marks: 80

General Instructions:

1. Answers to this Paper must be written on the paper provided separately.
2. You will **not** be allowed to write during 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 [].
7. This paper consists of 8 printed sides.

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)~~ Which of the given statements is **correct** regarding halogens and alkali metals with respect to an increase in the atomic number?

- (a) Reactivity decreases in alkali metals but increases in halogens.
- (b) Reactivity increases in both.
- (c) Reactivity decreases in both.
- (d) Reactivity increases in alkali metals but decreases in halogens.

~~(ii)~~ Which of the following is the best reagent to distinguish lead nitrate and zinc nitrate?

1. NaOH solution
2. KOH solution
3. NH₄OH solution

- (a) Only 1
- (b) Only 2
- (c) Only 3
- (d) Both 1 and 2

~~(iii)~~ HCl gas is passed through conc. sulphuric acid and collected in a jar. Red and blue litmus papers are placed in the jar. P, Q, R and S are the observations. Select the correct reaction of the litmus paper to HCl.

Observations	P	Q	R	S
Red litmus paper	Remains red	Remains red	Turns blue	Turns blue
Blue litmus paper	Turns red	Remains blue	Remains blue	Turns red

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

P.T.O

(iv) Ammonia is oxidised to N_2 with the help of :

1. Oxygen
2. Chlorine
3. Ammonium hydroxide
4. Metal oxide

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

(v) A certain molecule of a gas Z weighs 1.6 g at STP. The same volume of hydrogen at STP weighs 0.2 g. The molecular mass of gas Z is:

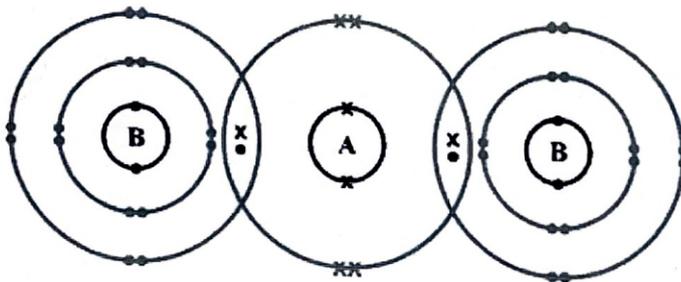
- (a) 8
- (b) 12
- (c) 16
- (d) 24

(vi) The formation of a covalent bond between two atoms is favoured when:

- P. Both the atoms have a large difference in electronegativity.
- Q. Both the atoms have high electron affinity.
- R. Both the atoms have high electronegativity.

- (a) Only P
- (b) Only Q
- (c) Both P and Q
- (d) Both Q and R

(vii) The diagram given below shows the bonding in the covalent molecule AB_2



Which option represents the correct electronic configuration of atoms A and B before combining together to form the above molecule?

	A	B
(a)	2, 4	2, 8, 6
(b)	2, 4	2, 8, 7
(c)	2, 8	2, 8, 8
(d)	2, 6	2, 8, 7

- (viii) Which of the following hydrocarbons undergo addition reactions:
 C_2H_6 , C_3H_8 , C_3H_6 , C_2H_2 , CH_4
 (a) C_3H_6 and C_2H_2
 (b) CH_4 and C_3H_8
 (c) C_2H_6 and C_3H_8
 (d) None of these
- (ix) Which of the following arrangements is **incorrect** as per the property stated against it?
 (a) $Li > Be > N > O$ (Metallic character)
 (b) $F > Cl > Br > I$ (Electron affinity)
 (c) $I < Br < Cl < F$ (Electronegativity)
 (d) $Mg < Ca < Sr < Ba$ (Number of shells)
- (x) If the soil pH is too high (too alkaline), which ion added through fertilisers will help **decrease alkalinity**?
 (a) H^+ ion
 (b) OH^- ion
 (c) CO_3^{2-} ion
 (d) O^{2-} ion
- (xi) Ravi has a compound, but instead of revealing its name, he provides the following clues. Read the clues carefully and identify the compound he might have.
 The chemical bonds in this molecule are formed by the **transfer of electrons**.
 The compound contains **only two elements**. Both elements achieve the **same noble gas electronic configuration** after bonding. Which compound is Ravi referring to?
 (a) $MgCl_2$
 (b) CO_2
 (c) NaF
 (d) K_2O
- (xii) A salt which in solution gives a dirty green precipitate with $NaOH$ solution and a white precipitate with $BaCl_2$ solution is:
 (a) $CuSO_4$
 (b) $FeSO_4$
 (c) $Fe_2(SO_4)_3$
 (d) $CuCl_2$
- (xiii) During electro-refining of copper which is **incorrect** statement?
 (a) Electrolyte is copper sulphate solution, acidified with sulphuric acid.
 (b) Electrolyte is a saturated copper sulphate solution only.
 (c) Anode is impure copper block.
 (d) Cathode is pure copper rod.
- (xiv) A salt formed by incomplete neutralization of an acid by a base.
 (a) $[Cu(OH)NO_3]$
 (b) $KHSO_3$
 (c) $NaNO_3$
 (d) $Na[Ag(CN)_2]$

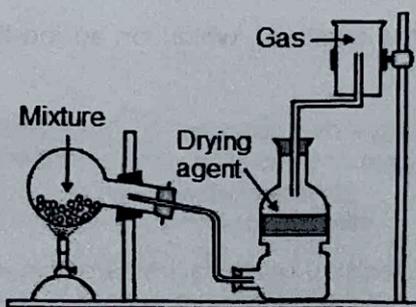
(xv) **Assertion (A):** Carboxylic acids react with alcohol in presence of concentrated H_2SO_4 to produce a fruity smell.

Reason (R) : It is due to the formation of an aldehyde.

- (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 diagram given below shows an experimental setup for the laboratory preparation of pungent smelling gas. The gas is alkaline in nature. [5]



- (a) Write the balanced chemical equation for the above preparation.
- (b) Name the drying agent used.
- (c) State the observation when this gas burns in oxygen.
- (d) Give a balanced chemical equation for the reaction of this gas with excess of chlorine.
- (e) Name the experiment to show the high solubility of this gas in water.

(ii) Fill up the blanks with the correct choice given in brackets. [5]

- (a) The _____ (lesser / greater) is the value of electron affinity the more oxidising is the nature of the element.
- (b) The number of chain isomers possible for an alkane with 5 carbon atoms are _____. (3 / 4)
- (c) Crushing of the ore into a fine powder is called _____. (pulverisation, smelting).
- (d) When dilute sodium chloride is electrolysed using graphite electrodes, the cation discharged at cathode most readily is _____. (Na^+ / H^+)
- (e) Dry hydrogen chloride gas can be collected by _____ displacement of air. (downward / upward)

(iii) State one significant observation: [5]

- (a) At the anode, when molten lead bromide is electrolysed using graphite electrodes
- (b) Chlorine gas is passed over moist starch iodide paper.
- (c) Ethanol and conc. sulphuric acid in excess is heated at high temperatures and the gas evolved is bubbled through a solution of bromine in an inert solvent.
- (d) Concentrated sulphuric acid is added to sugar crystals.
- (e) Sodium sulphite reacts with dilute sulphuric acid and the gas produced is tested with methyl orange indicator.

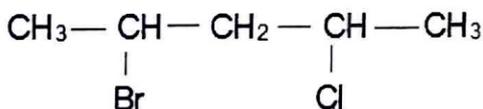
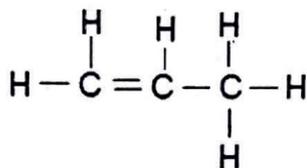
(iv) Match the salts given in Column A with their method of preparation given in Column B:

[5]

Column A	Column B
(a) CuSO_4 from $\text{Cu}(\text{OH})_2$	1. Simple displacement
(b) MgCl_2 from Mg	2. Titration
(c) FeCl_3 from Fe	3. Neutralization
(d) NaNO_3 from NaOH	4. Precipitation
(e) ZnCO_3 from $\text{Zn}(\text{NO}_3)_2$	5. Combination

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

[5]



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

1. 3-methyl-2-butanol
2. Propanoic acid
3. Ethanal

SECTION B (40 Marks)

(Attempt any four questions from this Section)

Question 3

- (i) Give one significant observation when:
- (a) Copper sulphide is treated with dilute hydrochloric acid. [2]
- (b) Ammonium hydroxide solution is added to ferric chloride solution in small quantities and then in excess.
- (ii) Give reasons:
- (a) The reducing power of elements decreases on moving from left to right along a period in the periodic table. [2]
- (b) Conductivity of dilute hydrochloric acid is greater than that of acetic acid.

(iii)

Write a balanced chemical equation for each of the following:

- (a) Action of concentrated sulphuric acid on carbon.
- (b) Action of dilute nitric acid on copper.
- (c) Action of dilute hydrochloric acid on magnesium sulphite.

[3]

(iv)

Atomic number of element M is 12 and it forms an ionic compound with element L.

- (a) Which of the following atomic numbers will match L?
A - 14 B - 10 C - 8
- (b) What is the name given to the members of the group to which element M belongs?
- (c) Draw the electron dot and cross structure of the compound formed between M and L.

[3]

Question 4

(i)

Give reason for each of the following:

- (a) Ethyne is more reactive than ethane.
- (b) Concentrated nitric acid appears yellow when it is left standing in a glass bottle.

[2]

(ii)

If 16.4 grams of calcium nitrate is heated, calculate

- (a) the volume of nitrogen dioxide obtained at STP.
- (b) the mass of calcium oxide obtained. [Ca= 40, N=14, O=16]

[2]



(iii)

Name the gas liberated when:

- (a) Water is added to calcium carbide.
- (b) Sodium reacts with the product formed on boiling bromoethane with aqueous alkali solutions.
- (c) Sulphur is treated with concentrated nitric acid.

[3]

(iv)

Give balanced equation for the following conversions A, B and C.

[3]



Question 5

(i)

Brown ring test is used for the identification of nitrate ions.

- (a) Why is freshly prepared ferrous sulphate solution used in the above test?
- (b) What is the chemical name of the brown ring?

[2]

(ii)

Draw the electron dot and cross structure of:

- (a) Ammonium ion
- (b) Methane molecule

[2]

(iii)

Give balanced chemical equations for the following:

- (a) Reaction of excess ethanol with concentrated sulphuric acid.
- (b) Burning of ethane in excess of oxygen.
- (c) Reaction of methyl iodide with Zn/Cu couple in alcohol.

[3]

- (iv) Answer the following questions with respect to the electrolytic process in the extraction of aluminium. [3]
- (a) Name the salt formed when the chief ore of aluminium reacts with concentrated sodium hydroxide solution.
- (b) Why is fluorspar added during the electrolytic reduction of aluminium?
- (c) Give reaction at the anode in extraction of aluminium from its above mentioned ore.

Question 6

- (i) Identify the reactants P and Q in the following reactions: [2]
- (a) Acetic acid + P \longrightarrow Ammonium acetate + Water
- (b) Sodium carbonate + Q \longrightarrow Sodium chloride + Calcium carbonate
- (ii) The empirical formula of a hydrocarbon is C_2H_3 . The hydrocarbon has a relative molecular mass of 54. (At wt: H = 1, C = 12) [2]
- (a) What is the molecular formula of the hydrocarbon?
- (b) Draw the structural formula of the hydrocarbon.
- (iii) Match the properties and uses of alloys in column I with appropriate answer in column II: [3]

Column I	Column II
1. The alloy is hard, brittle, takes up polish and used for making statues.	A. Brass
2. The alloy is lustrous, hard, corrosion resistant and used in surgical instruments	B. Duralumin
3. The alloy contains Cu and Zn, is hard, shining and is used in decorative articles	C. Stainless steel
	D. Bronze

- (iv) Write balanced chemical equations to show how SO_2 is converted to sulphuric acid in the contact process. [3]

Question 7

- (i) Name: [2]
- (a) The element which has the highest ionization potential.
- (b) The hydrocarbon used for welding purposes.
- (ii) Arrange the following according to the instructions given in brackets: [2]
- (a) Mg^{2+} , Cu^{2+} , Na^{1+} , H^{1+} (In the order of preferential discharge at the cathode)
- (b) Ethane, methane, acetylene, ethylene. (In the increasing order of the molecular weight) [H = 1, C = 12]
- (iii) For the preparation of hydrochloric acid in the laboratory: [3]
- (a) Direct absorption of hydrogen chloride gas in water is not feasible. Give reason.
- (b) State the arrangement used to dissolve HCl gas in water.
- (c) Draw the diagram to show the arrangement used for the absorption of hydrogen chloride gas in water.

Vapour density of a gas Z is 23. Calculate:

[3]

- (a) Number of moles
- (b) Weight in grams and
- (c) Number of molecules in 6.72 dm³ of gas at S.T.P.

Question 8

(i) PQ₂ is a hard crystalline solid having high melting and boiling points. It is a good conductor of electricity in both molten and aqueous forms. [2]

(a) The conductivity of PQ₂ is due to the presence of free _____ (ions, molecules, electrons)

(b) During electrolysis of aqueous PQ₂, if thickening of the cathode and thinning of the anode is observed, the anode material will be _____. (graphite, metal P)

(ii) State the inference drawn from the following observations: [2]

(a) On carrying out the flame test with a salt P a brick red flame was obtained. What is the cation in P?

(b) A salt Q on treatment with concentrated sulphuric acid produces a gas which fumes in moist air and gives dense white fumes with ammonia. What is the anion in Q?

(iii) Distinguish between the following pairs using the test given in the bracket: [3]

(a) Ammonium hydroxide and Sodium hydroxide (using copper sulphate solution)

(b) Dilute HCl and Dilute H₂SO₄ (using lead nitrate solution)

(c) Zinc nitrate and Zinc chloride (using silver nitrate solution)

(iv) Compound A is bubbled through bromine dissolved in carbon tetrachloride and the product is : [3]



(a) Draw the structural formula of A.

(b) Give the chemical equation to obtain the compound A in the laboratory from bromoethane.

(c) Name the compound formed when A undergoes catalytic hydrogenation reaction.

Question Paper 12
The J.B. Petit High School for Girls

Prelim Examination

10

Chemistry (Science paper -2)

Time:2 Hours

Max.Marks:80

INSTRUCTIONS

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

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

This time is to be spent in reading the question paper.

The time given at the head of this paper is the time allowed for writing the answers.

Section 'A' is compulsory. Attempt any four questions from Section 'B'.

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

Instructions for the Invigilators

Kindly read aloud the instructions given above to all the candidates present in the Examination Hall.

[At. Weights: N=14, S=32, H=1, O=16, C=12, Cl = 35.5]
[1L of H₂ at S.T.P. weighs 0.09 g]

Section A (40 Marks)

(Attempt *all* questions from this Section)

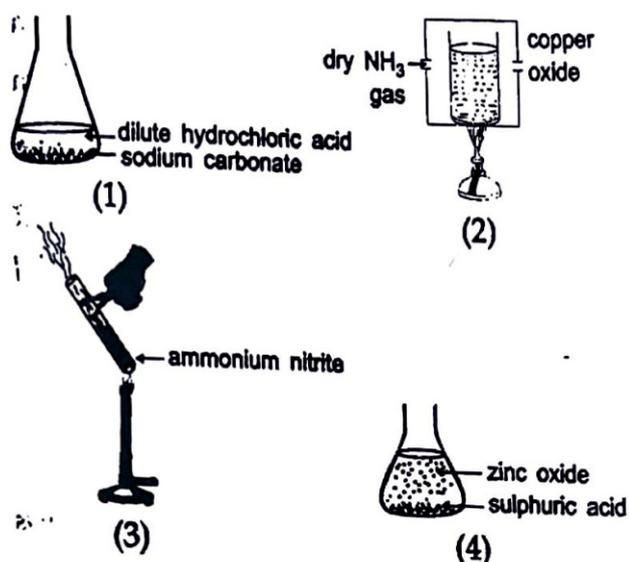
Question 1

Choose the correct answer to the questions from the given options: (Do not copy the question, write the correct answers only) [15]

- i. The correct order of electron affinities of N, O, S and Cl is;
- O = Cl , N = S
 - O < S < Cl < N
 - N < O < S < Cl
 - O < N < Cl < S

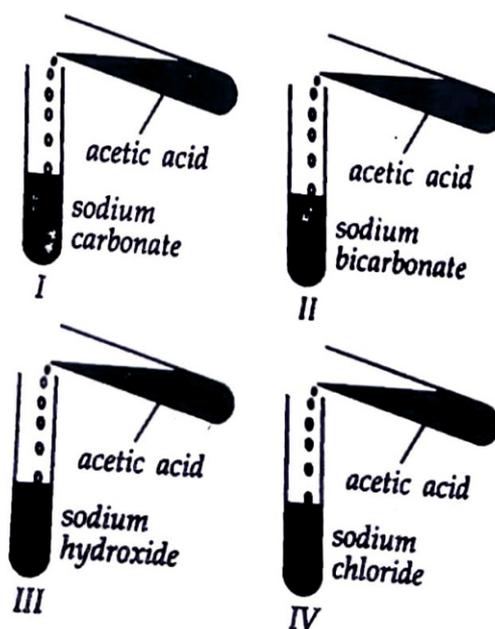
An acid which contains two hydrogen atoms but is monobasic?

- Sulphuric acid
 - Hydrochloric acid
 - Formic acid
 - Nitric acid
- iii. Four reactions are shown below in the diagram:



Which reaction produces nitrogen?

- 1 and 2
 - 1 and 3
 - 2 and 3
 - 1 and 4
- iv. A student added acetic acid to a test tube I, II, III and IV and then introduced a burning candle near the mouth of each test tube.



The candle would not be extinguished near the mouth of the test tubes

- a. I and II
- b. II and III
- c. III and IV
- d. I and IV

v. The anion discharged at the anode with most difficulty is;

- a. SO_4^{2-}
- b. Br^{1-}
- c. NO_3^{1-}
- d. OH^{1-}

vi. In the given equation identify the role played by concentrated nitric acid.



- a. Reducing agent
- b. Oxidizing agent
- c. Dehydrating agent
- d. Non-volatile acid

vii. Methyl orange turns pink when pH of a medium is likely to be;

- a. 13
- b. 12
- c. 7
- d. 2

viii. The problems in the back suction in the production of aqueous solution of NH_3 and HCl can be overcome by;

- a. Using promoter
- b. Funnel arrangement
- c. Occlusion
- d. Fountain experiment

ix. A compound P is heated in a test tube with sodium hydroxide solution. A paper soaked in potassium mercuric iodide solution held at the mouth of the test tube turns brown. Which of the following could be P?

- a. Copper (II) sulphate
- b. Zinc sulphate
- c. Ammonium sulphate
- d. Ferrous sulphate

Four reactions are shown below in the diagram:

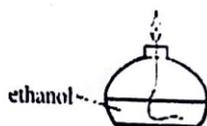
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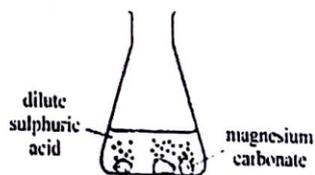
2.



3.



4.



Which of them produces ethene,

- 1 and 4
- 4 and 3
- 1 and 2
- 2 and 4

xi. The table given below provides the pH value of four solutions P, Q, R and S:

Solution	P	Q	R	S
pH	2	9	5	11

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

- a. $P > Q > R > S$
- b. $P > S > Q > R$
- c. $S < Q < R < P$
- d. $S < P < Q < R$

xii. Oxidation occurs at ;

- a. Cathode
- b. Anode
- c. First at cathode and then anode
- d. None of the above

xiii. Which is an alloy of tin?

- a. Bronze
- b. German silver
- c. Stainless steel
- d. Solder

xiv. Ethane, with molecular formula C_2H_6 , has;

- a. 9 covalent bonds
- b. 8 covalent bonds
- c. 7 covalent bonds
- d. 10 covalent bonds

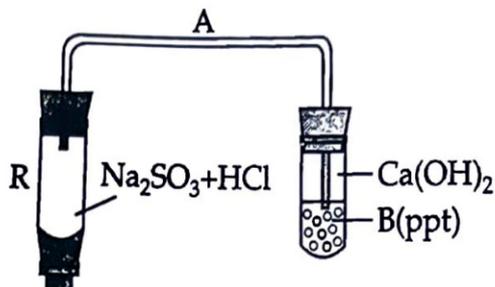
xv. Assertion (A) : Sodium hydroxide and ammonium hydroxide can be distinguished by using calcium nitrate solution.

Reasons (R) : Calcium nitrate gives a white precipitate with ammonium hydroxide solution.

- 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

- a. Study the diagram given and answer the questions that follows: [5]



- i. Name the gas evolved.
 - ii. Name and write the formula of B.
 - iii. Write the balanced chemical equation that takes place in the flask.
 - iv. Write the chemical equation that takes place when gas 'A' is passed through Ca(OH)_2 .
 - v. Name the acid obtained when gas 'A' is passed through water.
- b. Identify the following: [5]
- i. An alloy which is used in electrical fittings.
 - ii. The gas reduces black cupric oxide to brown metal.
 - iii. Compound which allows small amount of electricity to flow through them and contains ions as well as molecules.
 - iv. Self-linking ability of carbon atom.
 - v. Particles present in glucose.
- c. Complete the following by choosing the correct answers from the brackets: [5]
- i. The common name of ethanal is _____. (formaldehyde/acetaldehyde)
 - ii. An inert electrode used in electrolysis of molten lead bromide is _____. (platinum / graphite)
 - iii. Silver nitrate solution reacts with dil. HCl to give a precipitate which is soluble in _____. (dil. HNO_3 / NH_4OH solution)
 - iv. When sodium chloride is heated with concentrated sulphuric acid above 200°C , one of the products formed is _____. (sodium hydrogen sulphate / sodium sulphate)

d. Match the column 'A' with column 'B':

[5]

Column A

Column B

- | | |
|--|--|
| <ul style="list-style-type: none"> i. Cryolite ii. Pure Aluminium iii. Colourless cation iv. Solution whose pH is above 7 v. Nitric oxide | <ul style="list-style-type: none"> a. Calcium b. $\text{Cu}(\text{OH})\text{Cl}_2$ c. Hall Heroult's process d. Bayer's Process e. Enhances the conductivity of the mixture. f. Turns reddish brown when it reacts with oxygen. |
|--|--|

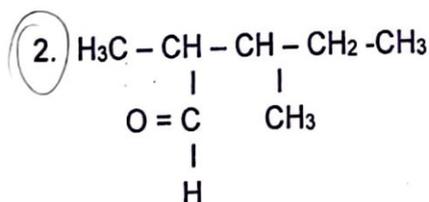
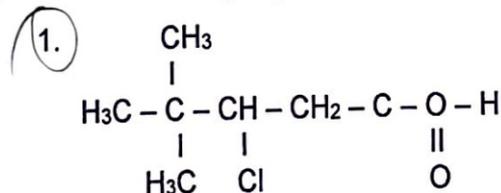
e.
i.

Draw the structural diagram for the following compounds: [3]

1. Neo-pentanal
2. Pent -1- ene - 4- yne
3. Chloroform

ii.

Name the following organic compounds in IUPAC system. [2]



Section B (40 Marks)

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

Question 3

i. Give one significant observation when:

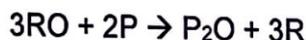
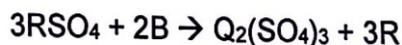
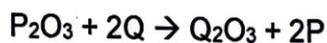
[2]

- a. Burning of ammonia in air.
- b. Lead nitrate is strongly heated in a test tube.

- ii. Give reasons: [2]
- a. Concentrated hydrochloric acid is not used as a reagent in the laboratory preparation of nitric acid.
- b. Electrical conductivity of acetic acid is less in comparison to that of dilute sulphuric acid.
- iii. Loshana needs 59 g of ammonium sulphate for her plants. She uses ammonia and sulphuric acid to prepare ammonium sulphate. Calculate the volume of ammonia required at S.T.P. to prepare the fertilizer. [3]
- iv. Write balanced chemical equations for the following reactions: [3]
- a. Preparation of lead chloride from lead oxide.
- b. Sodium metal is added to a test tube containing ethyl alcohol.

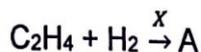
Question 4

- i. 'P', 'Q' and 'R' are three elements which undergoes chemical reactions according to the following equations: [2]



Answer the following questions:

- a. Which element is the most reactive?
- b. Which element is the least reactive?
- ii. Himaya wanted to prepare a saturated hydrocarbon from an unsaturated hydrocarbon at 200 °C - 300 °C as follows: [2]



- a. Identify 'X' where 'X' is the catalyst used for the reaction.
- b. Write the structural formula of the compound 'A'.
- iii. Chemically distinguish between the following questions. [3]
- a. Copper (II) oxide and Manganese dioxide
- b. Hot concentrated nitric acid and cold and dilute nitric acid.
- c. Ammonium hydroxide solution and Sodium hydroxide solution.
- iv. Identify the process of concentration of the following ores: [3]
- a. Sulphide
- b. Tin stone
- c. Heavy ore

Question 5

- i. How many moles of CH₄ are present in 24 g of methane? [2]
- ii. For the electrorefining of copper: [2]
 - a. What is the cathode made up of?
 - b. Write the reaction that takes place at the anode.
- iii. Draw the electron dot structure for the following: [3]
 - a. Hydroxide ion
 - b. Calcium oxide
 - c. Ethane molecule
- iv. Copy and complete the following table relating to the important industrial processes. Output refers to the product of the processes and not the intermediate steps. [3]

Name of the process	Inputs	Catalyst	Catalyzed chemical equation	Output
(a)	Ammonia and Oxygen	(b)	(c)	HNO ₃

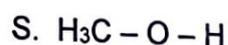
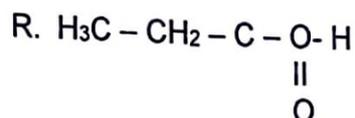
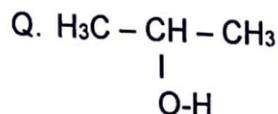
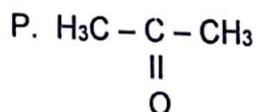
Question 6

- i. Give balanced equations for the following conversions (A to B): [2]

$$\text{Acetylene} \xrightarrow{A} \text{Ethylene} \xrightarrow{B} \text{1,2-Dibromoethane}$$
- ii. Define/State the following: [2]
 - a. Gay lussac's Law
 - b. Electroplating
- iii. Identify the Anions: [3]
 - a. Addition of dil. HCl to A produces a gas which turns lead acetate paper silvery black.
 - b. Addition of concentrated H₂SO₄ acid to a mixture of FeSO₄ and HNO₃ acid gives a dark brown unstable compound at the junction of the mixture.
 - c. Addition of barium chloride solution to this acid produces a white precipitate which is insoluble in any other volatile acid.
- iv. A gaseous hydrocarbon contains 82.76 % of carbon. Given that its vapour density is 29. Find its molecular formula. [3]

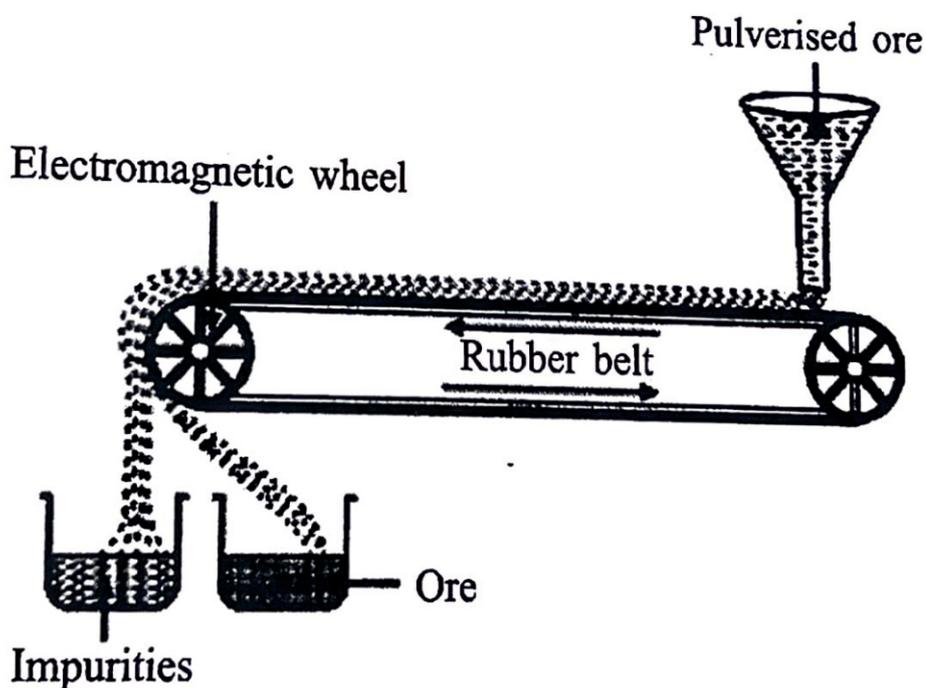
Question 7

i. Shown below are the structural formulae of four carbon compounds: [2]



- a. Which two of these compounds are more likely to same chemical properties.
- b. Identify the which of the above organic compounds are likely to have the same boiling points.

ii. Look at the given picture carefully and answer the related questions: [3]



- a. Identify the above process and state its principle of this process.
 - b. Give an example of ore related to this method.
- iii. Mention the property of conc. H_2SO_4 exhibited in each of the following reactions with: [2]
- a. Sugar
 - b. Non-metal

- iv. Identify the following phrases: [3]
- The process of strongly heating the ore in excess supply of air.
 - Undistilled alcohol containing large proportion of methanol.
 - The process in which an ionic compound in the molten state or in aqueous state dissociates into ions by the passage of electric current through it.

Question 8

- i. Calculate the volume of oxygen required when a mixture of 33.6 dm³ of methane and 22.4 dm³ of hydrogen burn completely as shown by the equation above. [2]
- $$\text{CH}_4 + 2\text{O}_2 \rightarrow \text{CO}_2 + 2\text{H}_2\text{O}$$
- ii. State giving reasons: [2]
- Metal nitrides are not used in the laboratory preparation of ammonia gas.
 - H₂SO₄ is not used as a drying agent for H₂S?
- iii. Calculate: [3]
- The atomicity of chlorine, if 35.5 g of it occupies 11,200 cm³ at S.T.P.
 - The V.D. and molecular mass of CO₂ if 200 ml of the gas at S.T.P. weighs 0.40g.
- iv. Explain Isomerism. Draw structural formula of chain isomer of Butanoic acid. [3]

Question Paper 13

GOKULDHAM HIGH SCHOOL & JUNIOR COLLEGE

SECONDARY SECTION (2025-2026)

PRELIMINARY EXAMINATION

SUBJECT: CHEMISTRY (SCIENCE PAPER II)

GRADE: 10

MARKS: 80

DATE: 20.01.2026

TIME: 2 Hours

-
- Answers to this Paper must be written on the paper provided separately.
 - You will not be allowed to write during the first 15 minutes.
 - This time is to be spent in reading the question paper.
 - The time given at the head of this Paper is the time allowed for writing the answers.
-
- **Section A** is compulsory. Attempt any **four questions** from Section B.
 - The intended marks for questions or parts of questions are given in brackets [].
 - This paper consists of **10** printed pages.
-

SECTION A

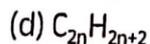
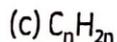
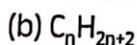
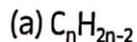
(Attempt all questions from this section)

Question 1

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

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

(i) The general formula of alkane is:



(ii) Calcium nitrate on reaction with sodium hydroxide gives _____.

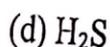
(a) white precipitate

(b) green precipitate

(c) reddish brown precipitate

(d) no precipitate

(iii) The gas produced by the action of conc. sulphuric acid on sodium nitrate is.....



(iv) Atomic weight of chlorine is 35.5. What is its vapour density?

- (a) 71
- (b) 32
- (c) 35.5
- (d) 70

(v) The vapour density of nitrogen dioxide is [N = 14, O = 16] is :

- (a) 32
- (b) 46
- (c) 44
- (d) 23

(vi) **Assertion(A)**: During laboratory preparation of nitric acid, an all glass apparatus is used.

Reason(R) : Nitric acid vapours are highly corrosive.

- (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.

(vii) The empirical formula of the compound is CH_2O , the possible molecular formula can be _____ .

- (a) $\text{C}_3\text{H}_6\text{O}_3$
- (b) $\text{C}_2\text{H}_4\text{O}$
- (c) $\text{C}_4\text{H}_3\text{O}_2$
- (d) $\text{C}_4\text{H}_6\text{O}_2$

(viii) Ekta placed electrolysis circuit in copper sulphate solution and observed that the colour of copper sulphate remained unchanged. Which of the following electrodes she might have used?

- X - anode: copper, cathode: copper
- Y - anode: copper, cathode: platinum
- Z - anode: platinum, cathode: copper

- (a) Only Z
- (b) Only Y
- (c) Only X
- (d) Both Y and Z

GRADE 10

CHEMISTRY | SCIENCE PAPER -2|

(ix) A compound which liberates reddish brown gas around the anode during electrolysis in its molten state is_____ .

- (a) Copper(II) oxide
- (b) Lead(II) oxide
- (c) Lead(II) bromide
- (d) Copper(II) sulphate

(x) **Assertion(A):** An element with atomic number 15 will form an acidic oxide.

Reason(R): Non- metallic oxides on reaction with water give acids.

- (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.

(xi) Ammonium hydroxide will produce a reddish brown precipitate when added to a solution of_____ .

- (a) CuSO_4
- (b) $\text{Zn}(\text{NO}_3)_2$
- (c) FeSO_4
- (d) FeCl_3

(xii) A piece of zinc(a reactive metal) was dropped into a test tube containing a substance. A zinc salt is formed and hydrogen gas is liberated. This is shown by the equation as: $\text{Zn} + \text{_____} \rightarrow \text{Zn salt} + \text{H}_2(\text{g})$

Which of the following can be the substance that zinc was dropped into?

- (a) Only P
- (b) Only Q
- (c) Only R
- (d) Either P or R

(xiii) State which of the following electronic configuration represents the most electronegative element.

- (a) 2,8,8
- (b) 2.8,6
- (c) 2,8,7
- (d) 2,8,1

GRADE 10

CHEMISTRY [SCIENCE PAPER -2]

(xiv) Identify the compound that has all three bonds i.e ionic, covalent and co-ordinate bonds.

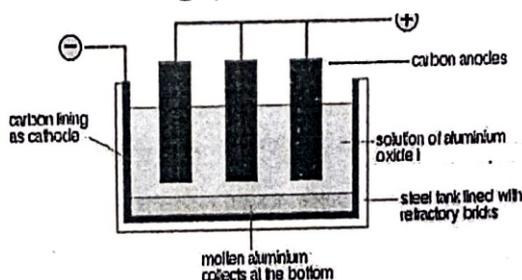
- (a) Sodium hydroxide
- (b) Ammonia
- (c) Calcium chloride
- (d) Ammonium hydroxide

(xv) A few crystals of KNO_3 are heated in a hard glass test tube. Name the gas evolved.

- (a) Nitrogen dioxide
- (b) Nitrogen monoxide
- (c) Nitrous oxide
- (d) Oxygen

Question 2

(i) This diagram shows an electrolysis tank used industrially to produce aluminium from alumina. Answer the following questions: [5]



(a) Name the other aluminium containing compound added to alumina and state its significance.

(b) Write the equation for the reaction that will occur at cathode and anode.

(c) Electrolysis is preferred over reducing agents to obtain aluminium from alumina. Explain.

(ii) Identify the following: [5]

(a) The property by virtue of which the compound has the same molecular formula but different structural formula.

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

(c) The process of formation of ions from molecules which are not in the ionic state.

(d) Hydrocarbon containing a triple bond used for welding purposes.

(e) The process used for the concentration of zinc blende.

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

(a) The naturally occurring compound of a metal from which the metal can be extracted is called its _____ [ore/mineral].

(b) In nitrogen molecule, each nitrogen atom share(s) _____ [two/three] electrons to complete its valence shell.

(c) Sulphur is oxidised by hot conc. nitric acid to give _____.

[nitric acid/sulphuric acid]

(d) Ethanol reacts with sodium metal at room temperature to liberate _____ gas.

[oxygen/ hydrogen]

(e) An element from period 3 & group 2 will form a/an _____ oxide.

[amphoteric / basic]

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

A	B
a) Sulphuric acid	1. Sulphide ores
b) Calcination	2. Zinc carbonate
c) Calamine	3. Contact process
d) Roasting	4. Ostwald's process
e) Nitric acid	5. Carbonate ores

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

1. 2,3 -dichlorobutane

2. Pentan-2-ol

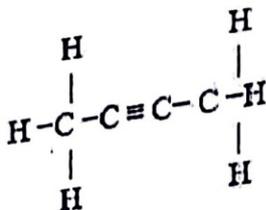
3. 1-propanal

GRADE 10

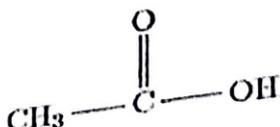
(b) Give IUPAC name for the following organic compounds:

[2]

1.



2.



SECTION -B (40 Marks)

(Attempt any four questions from this section)

Question 3

(i) With reference to laboratory preparation of nitric acid, answer the following questions. [2]

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

(b) Nitric acid turns pale yellow if stored for a long time. Justify your answer. [2]

(ii) Identify **P** and **Q** from the following observations:

(a) Salt **P** is white in colour. On strong heating, it produces buff yellow residue and liberates reddish brown gas. Solution of salt **P** produces chalky white insoluble precipitate with excess of ammonium hydroxide.

(b) A salt **Q** on reacting with conc. HCl liberates a pungent greenish yellow gas which turns moist starch iodide paper blue black. [2]

(iii) Give reasons:

(a) Hydrogen chloride fumes in moist air but hydrogen sulphide does not.

(b) Ethanol can be converted to ethane using conc. sulphuric acid.

(c) The electron affinity of Argon in period 3 of the periodic table is zero. [3]

(iv) Give a chemical test to distinguish between following pairs of compounds using the reagent given in the bracket: [3]

(a) Ethane and Ethyne. [using bromine solution in CCl_4]

(b) Sodium sulphide solution and sodium sulphite solution. [using dilute H_2SO_4]

(c) Calcium nitrate solution and Zinc nitrate solution.

[using NaOH solution in excess]

Question 4

(i) Identify the ion present in the following compounds. [2]

(a) Compound **X** which on reacting with dilute sulphuric acid liberates a gas which has no effect on acidified potassium dichromate but turns lime water milky.

(b) The solution of Compound **D** on reacting with ammonium hydroxide solution in small quantity forms a pale blue precipitate which is soluble in excess of ammonium hydroxide solution forming a coloured solution.

(ii) Write balanced equation for the following: [3]

(a) Chlorination of trichloromethane in presence of diffused sunlight.

(b) Nitrogen tri chloride from ammonia.

(iii) State the observation for the following, when: [3]

(a) Lead nitrate solution is mixed with dilute HCl and then warmed.

(b) Copper nitrate crystals are heated strongly.

(c) Concentrated sulphuric acid is poured over saw dust.

(iv) 8.2 grams of Calcium nitrate is decomposed by heating, according to the equation: $2Ca(NO_3)_2 \rightarrow 2CaO + 4NO_2 + O_2$ [3]

Calculate the following:

(a) Volume of nitrogen dioxide obtained at STP

(b) Mass of CaO formed. [At wt: Ca=40, N= 14, O=16]

Question 5

(i) Identify the substance underlined in each of the following: [2]

(a) The electrode that increases in mass during electro-refining of copper.

(b) The acid that is a drying as well as dehydrating agent.

[2]

(ii) Justify the following statements:

(a) Alkali metals are good reducing agents.

(b) Graphite electrodes are preferred in the electrolysis of molten lead bromide.

(iii) You are provided with the alloys in the box. Match the alloys with their use: [3]

Duralumin	Solder	Brass	Stainless steel
-----------	--------	-------	-----------------

(a) Decorative articles

(b) Surgical instruments

(c) Aircraft body

(iv) (a) State the volume occupied by 40 g of methane at S.T.P., if its vapour density is 8.

(b) Calculate the number of moles present in 160 g of NaOH. [Na= 23, O=16, H=1] [3]

[3]

Question 6

[2]

(i) (a) State the meaning of: Lone pair of electrons

(b) Draw structure of the negative ion when Calcium oxide dissolves in water and forms a positive ion and a negative ion.

(ii) What property of Sulphuric acid is exhibited in each of the following cases:

(a) In preparation of nitric acid when it reacts with Potassium nitrate.

(b) In preparation of copper sulphate from copper oxide. [2]

[2]

(iii) Write the balanced equations with conditions for the following conversion reactions to take place. [3]

[3]

(a) Bromoethane to ethanol

(b) Nitrogen to ammonia

(c) Rock salt to hydrogen chloride gas.

(iv) Arrange the elements given below as per the instructions in brackets. [3]

[3]

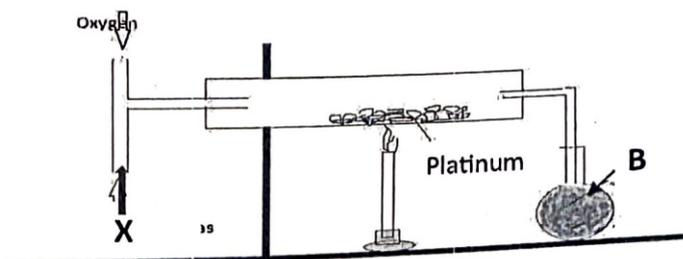
(a) Cu^{2+} , Na^{1+} , Zn^{2+} , Ag^{1+} [in order of preferential discharge at cathode]

(b) Sulphuric acid, Phosphoric acid, Acetic acid [in increasing order of number of replaceable hydrogen atoms per molecule]

(c) P, Mg, Na, Cl [in decreasing order of atomic size]

Question 7

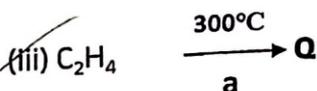
(i) When two dry gases, oxygen and **X** are passed over heated platinum, reddish brown fumes are seen in the receiving flask **B** as shown in the figure. [2]



(a) Name the gas **X**.

(b) Give equation(s) with conditions if any that resulted in the formation of reddish brown fumes.

(ii) Calculate the empirical formula of a compound whose molecular formula is $C_2H_4O_2$ and empirical formula weight is 30. [C=12, H=1, O=16] [2]



Given above is the representation of the conversion of ethene to a saturated hydrocarbon **Q** where 'a' stands for the catalyst.

(a) Identify 'a'

(b) Give the complete equation for the conversion of C_2H_4 to **Q**

(c) Name the above conversion.

(iv) Rohit wants to electroplate a spoon with silver. [3]

(a) To which electrode should he connect the article to be electroplated.

(b) What should be the anode made up of?

(c) Write the equation for the reaction that will occur at the cathode.

Question 8

[2]

(i) Differentiate between the following:

- (a) Ionisation potential and Electron affinity
- (b) Oxidising electrode and Reducing electrode

(ii) Ethane is exploded with oxygen (ie in excess air). If the volume of ethane used is 300 cc and oxygen is 1250 cc . Calculate:

[2]

- (a) Volume of carbon dioxide formed.
- (b) Volume of unused oxygen

(iii) Identify the **reactant** and write balanced equation for the following: [2]
Concentrated Hydrochloric acid reacts with a black compound 'P' to give salt, water and a greenish yellow gas.

(iv) Choose a method of preparation of the following salts from the methods given in the list: [4]

A: Neutralisation , B: Precipitation , C: Direct combination , D: Substitution

- (a) Lead[II] chloride
- (b) Iron [II] sulphate
- (c) Sodium nitrate
- (d) Iron[III] chloride



GSSHETTY INTERNATIONAL SCHOOL
ACADEMIC YEAR 2025-26
PRELIMINARY EXAMINATION 3

GRADE: X
SUBJECT: CHEMISTRY
DATE: 09.01.26

MARKS: 80
DURATION: 2 HRS
NO OF PAGES: 8

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

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

This time is to be spent in reading the question paper.

The time given at the head of this paper is the time allowed for writing the answers.

Section A is compulsory. Attempt any four questions from Section B.

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

Section A

(All the questions are compulsory)

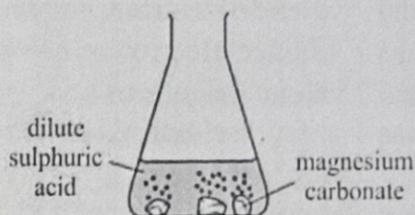
Question 1. Choose one correct answer to the questions from the given options: [15]

1. The chemical used in Baeyer's process to remove impurities from Bauxite ore is:

- a) Conc. NaOH b) dilute NaOH
c) Aqua regia d) Conc. Sulphuric acid

2. Dilute sulphuric acid is added to Magnesium carbonate what is the gas produced?

- a) Sulphur dioxide c) Hydrogen gas
b) Carbon dioxide d) Oxygen gas



3. The reactants used for the preparation of Hydrogen chloride gas in laboratory are:

- a) Conc. H_2SO_4 and KNO_3 b) Conc. HNO_3 and $NaCl$
c) Conc. H_2SO_4 and $NaCl$ d) dilute H_2SO_4 and $NaCl$

4. Which of the following compounds when treated with warm water produces Ammonia gas?

- a) Calcium carbide b) Ammonium nitrate
c) Sodium hydroxide d) Magnesium nitride

5. Dilute nitric acid reacts with Copper metal and produce:

- a) $NO + Cu(NO_3)_2 + H_2O$ c) $NO + Cu(NO_3)_2 + H_2$
b) $NO_2 + Cu(NO_3)_2 + H_2O$ d) $N_2 + Cu(NO_3)_2 + H_2O$

6. Assertion: Sulphuric acid forms two types of salts

Reason: Sulphuric acid is a non-volatile acid

- a) Both Assertion and Reason are correct and Reason is the correct explanation for the assertion

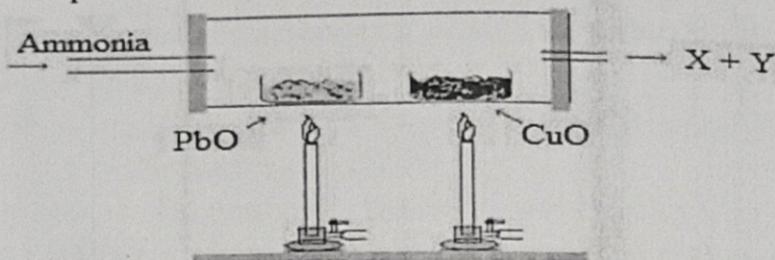
- Lead metal is deposited on cathode and Oxygen gas released at anode
 d) Lead metal is deposited on cathode and Hydrogen gas released at anode

Question 2

A. Answer the following

[5]

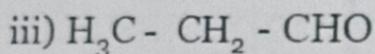
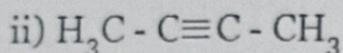
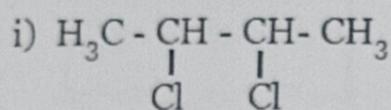
In the following diagram Ammonia gas is passed over hot Lead Oxide and Copper oxide and gives out the vapours of X and Y.



1. What property of Ammonia gas is shown in this reaction?
 2. Write balanced equation for the reaction between Ammonia gas and PbO.
 3. If the gas 'Y' reacts with Hydrogen gas in presence of Iron produces Ammonia gas, then name the gas 'Y'.
 4. What will be the colour change in Copper oxide at the end of the reaction?
 5. If Hydrogen gas is passed instead of Ammonia gas, then would we get the same residues left? Justify your answer.
- B. Complete the following by choosing the correct answers from the bracket. [5]
1. Ionisation potential increases across the period as the _____ (atomic size/ nuclear pull) increases.
 2. In the formation of Sodium chloride, Sodium metal atom undergoes _____ (oxidation/ reduction)
 3. Lead metal is _____ (amphoteric/ acidic/ basic) in nature so reacts with NaOH to produce Hydrogen gas.
 4. _____ (strong/ weak) electrolyte conducts small amounts of electricity.
 5. Alkali metals are strong reducing agents because they lose _____ (one/ two) electron/s very easily.
- C. Match the following: [5]
- | | |
|--|-----------------------------------|
| 1. Conc. HCl + MnO ₂ | a. Black residue ¹ |
| 2. Conc. HNO ₃ + Cu | b. Greenish yellow gas |
| 3. dil.HCl + AgNO ₃ sol. | c. Brown colour ppt |
| 4. NH ₃ + Nessler's reagent | d. Reddish brown gas ² |
| 5. Conc. H ₂ SO ₄ + Sugar crystals | e. White ppt ³ |
| | f. Dense white fumes ⁴ |
- D. Name the following: [5]
1. Hydrocarbons which have general formula C_nH_{2n+2}.
 2. The most electro-negative element.
 3. A compound with all three types of bonds.
 4. An acid used as food preservative.
 5. A trivalent metal which is amphoteric in nature

E.A. Write the IUPAC names of the following organic compounds:

[3]



B. Draw the structure for the following:

1. Propan-2-ol
2. Pentanoic acid

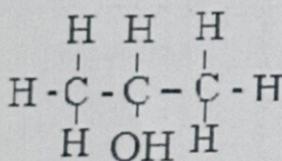
Section B

(Attempt any four questions from this section)

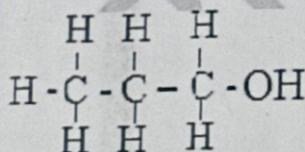
Question 3

A. The following diagrams show two isomers:

[3]



(A)



(B)

1. What type of isomerism is shown by these two compounds?
2. Identify the functional group present in these compounds.
3. Write the molecular formula of these compounds.

B. A small portion of The Periodic Table is given below. Study the table and answer the questions given:

[4]

	Group 1	2	13	14	15	16	17	18
Period 2	A	B		G	L	D		
Period 3	Y	E		J			Q	R

“Do NOT identify the elements”

1. Which element has 1 valence electron?
2. What is the difference between the elements ‘Q’ and ‘R’ in terms of their electronic configuration?
3. Arrange the elements of period 3 (from above table) in the decreasing order of Electronegativity.
4. A divalent non-metal in this table is _____.

- C. A mixture of 40lit of ethane and 150lit of Oxygen gas is ignited in a closed chamber and the resultant contents are cooled to room temperature. Calculate the composition of the final mixture. [3]

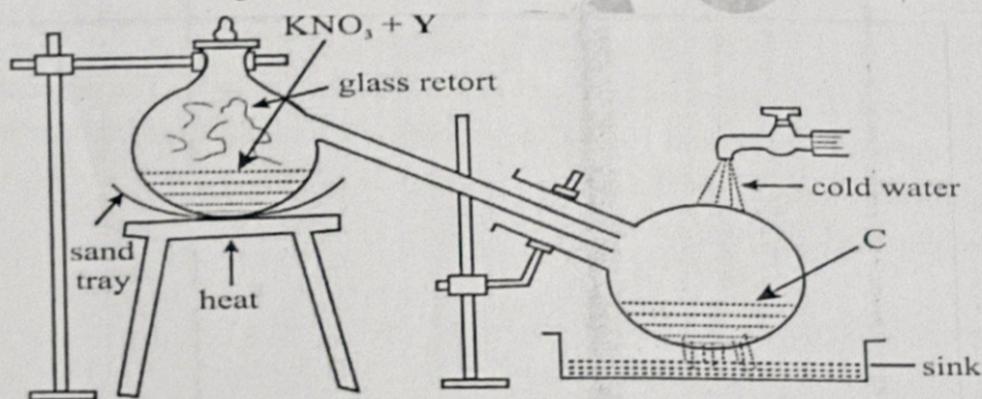
Question 4.

- A. 1. Substance 'X' is a salt. Identify the salt with following information [3]
Exp-1: When the salt is treated with an acid, it produces a suffocating gas which decolourises potassium permanganate solution
Exp-2: When the salt solution is added with small amount of Ammonium hydroxide, it forms a gelatinous white precipitate
2. Write balanced equation for the reaction if the above acid salt reacts with Sulphuric acid.
3. Name the gas produced in the Exp-2 mentioned above.

- B. Draw the dot and cross structure of the following: [3]
1. Hydronium ion
2. Oxygen molecule
3. Calcium oxide

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

- C. Given below is the diagram for the laboratory preparation of Nitric Acid. [4]



1. Name the reactant labelled Y.
2. Write a balanced equation for the reaction between Y and KNO_3 .
3. The complete apparatus is made up of glass. Why?
4. State why concentrated HNO_3 appears slightly yellowish in colour when left standing in a glass bottle for a long time.

Question 5

- A. Give reason for the following: [2]
1. Ionisation potential decreases down a group.
2. Ionic compounds do not conduct electricity in solid state.

- B. P, Q, R and S are the different methods of preparation of salts. [3]

- P - Simple displacement
Q - Neutralisation by titration
R - Precipitation
S - Direct combination

Choose the most appropriate method to prepare the following salts:

1. PbCl_2
2. FeCl_3
3. Na_2SO_4

C. A gas cylinder can hold 150 g of hydrogen under certain conditions of temperature and pressure. If an identical cylinder with the same capacity can hold 450 g of gas 'G' under the same conditions of temperature and pressure, find: [2]

1. the vapour density of the gas 'G'.
2. the molecular weight of gas 'G'.

D. Give balanced equations for the following: [3]

1. Action of dilute hydrochloric acid on ammonium carbonate.
2. Oxidation of sulphur with hot concentrated nitric acid.
3. Reaction of concentrated sulphuric acid with carbon.

• Question 6

A. An organic compound 'X' contains carbon, oxygen and hydrogen only. The percentage of carbon and hydrogen are 47.4% and 10.5% respectively. The relative molecular mass of 'X' is 76. Find the empirical formula and the molecular formula of 'X'.

[Atomic weight: C=12, O=16, H=1] [4]

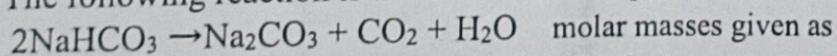
B. Write a balance chemical equation to show the following. [3]

1. The oxidising action of conc. Sulphuric acid on carbon.
2. The behaviour of H_2SO_4 as an acid when it reacts with magnesium.
3. The dehydrating property of conc. Sulphuric acid with sugar.

C. A mixture of 40lit of ethane and 150lit of Oxygen gas is ignited in a closed chamber and the resultant contents are cooled to room temperature. Calculate the composition of the final mixture. [3]

Question 7

A. The following reaction is the thermal decomposition of Sodium bicarbonate [4]



[$\text{NaHCO}_3 - 72\text{g}$, $\text{Na}_2\text{CO}_3 - 106\text{g}$, $\text{CO}_2 - 44\text{g}$]

If 120g of Sodium bicarbonate is heated, then Calculate:

1. The mass of Sodium carbonate produced

2. Volume of Carbon dioxide
3. Number of moles of Carbon dioxide
4. Number of moles of Sodium bicarbonate taken.

B. Mention the property of conc. H_2SO_4 exhibited in each of the following reactions with: [3]

1. Sugar
2. Metallic chloride
3. Non metal such as carbon

C. The empirical formula of a hydrocarbon is C_2H_3 . The hydrocarbon has a relative molecular mass of 54. (At wt: H = 1, C = 12) [3]

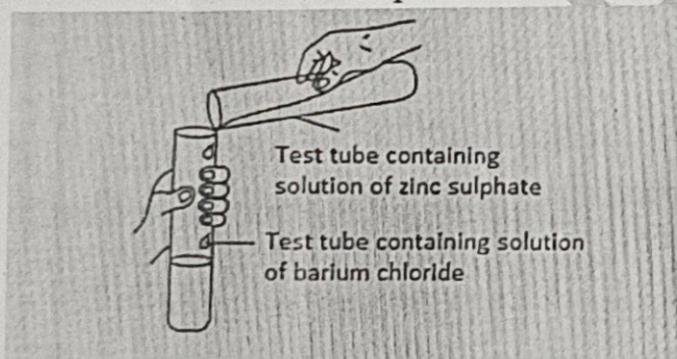
1. What is the molecular formula of the hydrocarbon?
2. Draw the structural formula of the hydrocarbon.
3. Give the general formula of the hydrocarbon.

Question 8

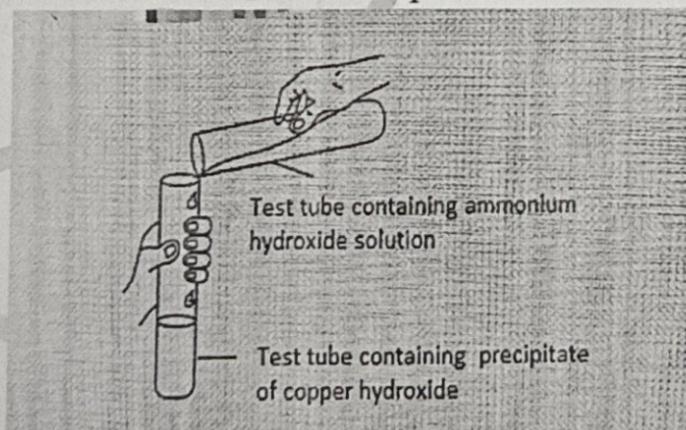
A. A student was asked to perform two experiments in the laboratory based on the instructions given: [2]

Observe the picture given below and state one observation for each of the Experiments 1 and 2 that you would notice on mixing the given solutions.

1. Experiment 1

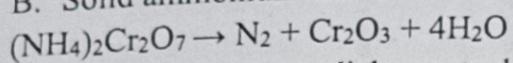


2. Experiment 2



[3]

B. Solid ammonium dichromate decomposes as under:



If 126 g of ammonium dichromate decomposes, calculate:

1. the number of moles of ammonium dichromate that undergoes decomposition.
2. the mass of chromic oxide formed at the same time.
3. the volume of nitrogen gas evolved at STP.

[At. Wt: N=14, Cr =52, O=16, H=1]

[3]

C. Identify the reactants P, Q and R in the following reactions:

1. Copper oxide + P \rightarrow Copper + water
2. Iron pyrite + Q \rightarrow Iron oxide + Sulphur dioxide
3. Sodium chloride + R \rightarrow Sodium nitrate + Silver chloride

[2]

D. Name the main metal present in the following alloys:

1. Duralumin .
2. Brass .

*****ALL THE BEST*****

GSSSIS Prelim III



The Cathedral & John Connon School
Preliminary Examination

Sub: Chemistry
Std: X
Date: 09-01-2026

Marks: 80
Time: 2 Hrs

Candidates are allowed additional 15 minutes for reading the paper.

Section A is compulsory. Attempt any four questions from Section B.

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

No of Printed Sides – 8

SECTION A

(Attempt all questions from this Section).

Question 1

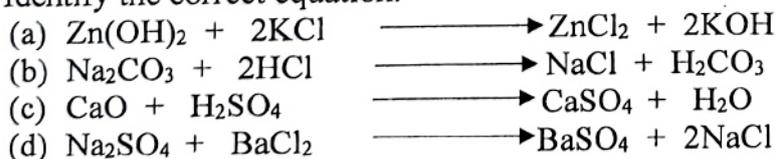
Choose the correct answers to the questions from the given options:

[15]

- (i) Identify the process that is based on the concept of neutralization.
- (a) Rusting of iron
 - (b) Taking digene during indigestion.
 - (c) Digestion of food.
 - (d) Formation of Nitric oxide during lightning.
- (ii) What are the products obtained at the cathode and anode during the electrolysis of fused copper chloride?

	Anode	Cathode
(a)	Hydrogen	Oxygen
(b)	Chlorine	Copper
(c)	Oxygen	Hydrogen
(d)	Copper	Chlorine

- (iii) Identify the correct equation.



- (iv) Twinkle performed 3 experiments on compound X. And she observed the following:
- Compound X turns blue litmus red.
 - Dilute solution of compound X liberates a gas with rotten egg smell, when it is treated with sodium sulphide.
 - Concentrated solution of compound X turns sugar crystals into a black spongy mass.
- Compound X is:
- Sulphuric acid.
 - Nitric acid
 - Hydrochloric acid
 - Acetic acid.
- (v) Ammonia is used in:
- Contact process
 - Ostwalds process
 - Bayers process
 - Habers process.
- (vi) The number of g atoms in 24 gm sulphur is: [At. Mass of S = 32]
- 0.5
 - 0.75
 - 1.5
 - 1.75
- (vii) An element X has 4 electrons in its outermost M shell. What will be its position in the periodic table?
- Period 3 group 4
 - Period 4 group 3
 - Period 3 group 14
 - Period 4 group 13
- (viii) Two organic compounds A and B react with each other in presence of concentrated sulphuric acid to give a compound that has a fruity smell. The compounds A and B are:
- CH_3OH and CH_3CHO
 - CH_3OH and CH_3COOH
 - CH_3Cl and CH_3COOH
 - CH_3OH and CH_3Cl
- (ix) The common name of the compound with the molecular formula C_2H_4 is:
- Ethylene
 - Ethene
 - Ethyne
 - Acetylene

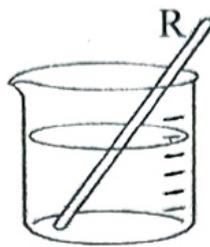
- (x) 3 metal strips P, Q and R were put in 3 different beakers containing copper sulphate solution .



Solution A



Solution B



Solution C

After some time, it was observed that:

- i. Solution A was blue in colour.
- ii. Solution B turned green
- iii. Solution C turned colourless.

Identify the metals P, Q and R:

- (a) P -Ag , Q - Mg , R - Fe
- (b) P -Mg , Q - Fe , R - Ag
- (c) P -Ag , Q - Fe , R - Mg
- (d) P - Fe , Q - Mg , R - Ag

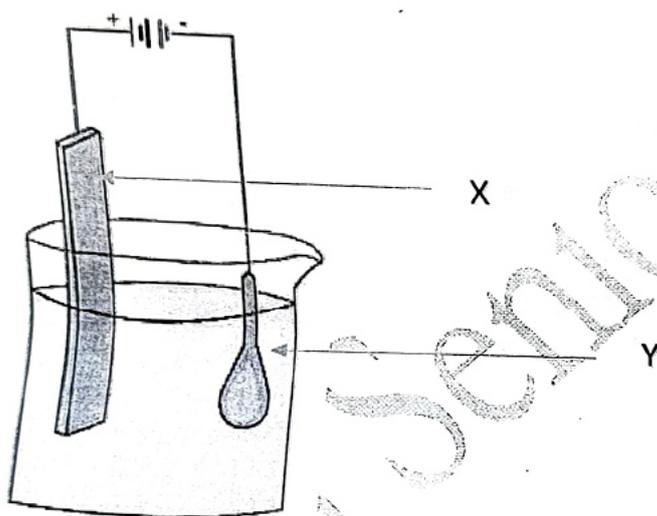
- (xi) Assertion: Ammonia does not conduct electricity in gaseous or liquefied state.
Reason: Ions in gaseous ammonia or liquefied ammonia are not free to move.
- (a) Assertion and reason both are true, and reason is the correct explanation of assertion.
 - (b) Assertion and reason both are true, and reason is not the correct explanation of assertion
 - (c) Assertion is true but reason is false.
 - (d) Assertion is false but reason is true.
- (xii) Assertion : Nitric acid prepared in the laboratory is yellow in colour.
Reason : A reddish brown gas is used in its preparation.
- (a) Assertion and reason both are true, and Reason is the correct explanation of assertion.
 - (b) Assertion and reason both are true, and Reason is not the correct explanation of assertion
 - (c) Assertion is true but reason is false.
 - (d) Assertion is false but reason is true.
- (xiii) The number of bond pairs and lone pairs in chloroethane is:
- (a) 4 & 3
 - (b) 3 & 4
 - (c) 6 & 3
 - (d) 7 & 3

- (xiv) Which of the following is **not** true for dilute hydrochloric acid?
 P. It is a volatile acid.
 Q. It is an oxidising agent
 R. It is a monobasic acid.
 S. It liberates a colourless odourless gas when zinc granules are added to it.
- (a) P & R (b). R & S (c). Only R (d). Only Q

- (xv) Which of the following contains the least number of moles?
 (a) 11 gm of carbon dioxide.
 (b) 32 gm of Oxygen gas.
 (c) 32 gm of Sulphur dioxide.
 (d) 35.5 gm of chlorine gas.

Question 2:

- (i) The set up below shows the electroplating of a steel spoon with silver. [5]



- (a) Specify and identify the electrodes X and Y.
 (b) Name the electrolyte used and give its molecular formula.
 (c) Identify the spectator ions and give the anode reaction.
 (d) Give balanced chemical equations for:
 1. Thermal decomposition of silver nitrate.
 2. Precipitation reaction with silver nitrate solution.

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

Column A	Column B
(a) Carbon tetrachloride	1. Reduction of alkene
(b) Calcium oxide	2. Non polar covalent compound
(c) Nickel at 300°C	3. Ionic compound
(d) Hydrogen chloride	4. Dehydration of alcohol
(e) Conc. sulphuric acid at 170°C	5. Polar covalent compound.

(iii) Fill in the blanks: (Do not copy the statements)

[5]

- Metals have a tendency to _____ electrons and behave as _____ agents.
- Copper chloride solution gives _____ when it is treated with few drops of ammonium hydroxide, and _____ with excess ammonium hydroxide.
- The radius of a cation is _____ than its parent atom, whereas the radius of an anion is _____ than its parent atom.
- _____ is converted to zinc oxide by calcination, and _____ is converted to zinc oxide by roasting.
- The molecular formula of an alkane with 12 carbon atoms would be _____ and the molecular formula of an alcohol with 10 carbon atoms would be _____.

[5]

(iv) Identify the following:

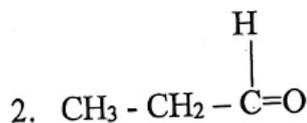
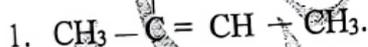
- The term used to express the volume occupied by 1 mole of any gas at STP.
- The amount of energy required to remove an electron from the outermost orbit of an atom.
- The products formed during the thermal decomposition of ammonium nitrate.
- The common name of a carboxylic acid with one carbon atom.
- The term used to describe the extraction of metals from its ores.

[5]

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

- 3-methyl butan-2-ol
- Pentanoic acid
- 1,1-dichloro but-2-yne

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

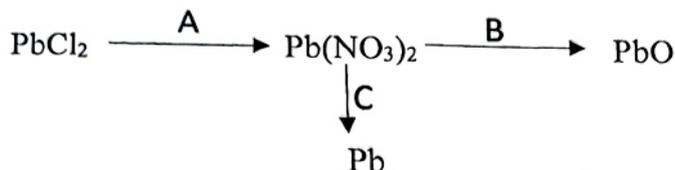


SECTION B

(Attempt any *four* questions)

Question 3:

- (i) Give balanced chemical equations for the following conversions: [3]



- (ii) (a) An organic compound X contains 48.64% carbon, 8.13% hydrogen and 43.23% oxygen. If the RMM of the compound is 74, find its molecular formula. [3]
 [C = 12, H = 1, O = 16]
- (b) If the above organic compound is a carboxylic acid, give its condensed formula and its IUPAC name. [1]
- (iii) Give scientific reasons for the following: [3]
- Sodalime is preferred to NaOH in the laboratory preparation of methane.
 - The atomic size of fluorine is smaller than that of lithium.
 - Hydrogen chloride gas is dissolved in water using an inverted funnel arrangement.

Question 4

- (i) Identify the compounds E and F based on the following experimental observations: [2]
- Compound E when heated with an alkali liberates a pungent smelling gas that turns Nessler's reagent brown. Aqueous solution of compound E when treated with barium chloride solution gives a white precipitate which is insoluble in dilute hydrochloric acid.
 - Compound F is an acid salt. It liberates a colourless, odourless gas that turns lime water milky when treated with dilute hydrochloric acid. An aqueous solution of compound F gives a white ppt. with excess sodium hydroxide solution.
- (ii) The following questions relate to the electrolytic reduction of pure alumina: [4]
- Why was electrolytic reduction chosen as the method for reducing alumina?
 - Why is powdered coke sprinkled over the electrolytic mixture?
 - Give the composition of the electrolytic mixture and justify the use of any one of its components.
 - Give the electrode reactions.
- (iii) Give balanced chemical equations for the following: [3]
- Preparation of ethyne from 1,2- dibromoethane
 - Preparation of carbon tetrachloride from chloroform.
 - Preparation of methane from iodomethane.
- (iv) Identify the gas/es evolved in each of the following cases: [1]
- Chlorine is treated with excess ammonia.
 - Carbon is treated with concentrated nitric acid.

Question 5:

- (i) 39 gm of Aluminium hydroxide when heated at 1000°C gives pure alumina and water vapour. [H =1, O =16, Al =27] [3]
 (a) Give a balanced chemical equation for the above reaction.
 (b) Find the mass of pure alumina that is produced.
 (c) Calculate the number of moles of water vapour formed.
- (ii) Name the main metals present in the following alloys: [2]
 (a) Brass.
 (b) Solder.
- (iii) Arrange the following as per instructions given in the brackets: [2]
 (a) Cs, Na, K, Li. (increasing order of I.P)
 (b) Cl, Na, Si, Ar. (increasing order of E.A)
- (iv) Give balanced chemical equations for the following: [3]
 (a) Burning of ammonia in oxygen.
 (b) Laboratory preparation of hydrochloric acid.
 (c) Action of concentrated nitric acid on sulphur.

Question 6:

- (i) Give balanced chemical equations for the preparation of the following salts using the reagents given below: [2]
Sulphuric acid, calcium chloride, sodium carbonate, potassium hydroxide, calcium oxide, potassium, carbonic acid.
 (a) Potassium sulphate
 (b) Calcium carbonate.
- (ii) Sanjana and Saima were both asked to distinguish Zinc nitrate and lead nitrate solutions in the laboratory. Sanjana added sodium hydroxide solution to both the solutions, whereas Saima added ammonium hydroxide to both the solutions. [3]
 (a) Who do you think will be successful in the task given? Justify your answer.
 (b) Give another method by which you would have distinguished the two solutions.
- (iii) Identify the reactants P & Q in the following reactions and give balanced chemical equations for the reactions. [3]
 (a) Manganese dioxide + P $\xrightarrow{\Delta}$ manganese chloride + water + chlorine
 (b) Copper oxide + Q $\xrightarrow{\Delta}$ Copper + Nitrogen + water vapour.
- (iv) Draw the electron dot diagram of the positive ion formed when ammonia gas is dissolved in water. [2]

Question 7:

- (i) Elements X, Y and Z have the atomic numbers 12, 17 and 6. Answer the following questions using only the alphabets given. [4]
- What type of bonding will be formed between the elements X and Y?
 - Give the electron dot diagram for the formation of the compound formed between X and Y.
 - Give the molecular formula of the compound formed if Y and Z combine.
 - State the position of X and Z in the periodic table.
- (ii) Give one observation for the following reactions and identify the property exhibited by the underlined compound. [3]
- Ammonia is treated with excess chlorine.
 - Sulphur is treated with concentrated sulphuric acid.
- (iii) (a) 12 litres of hydrogen combines with 8 litres of nitrogen to prepare ammonia. Calculate the volume of ammonia produced. The ammonia formed is passed through an inverted funnel arrangement. Calculate the volume of residual gases if any. [3]
- (b) Give the statement of the law on which the above numerical is based.

Question 8:

- (i) (a) Draw a neat, labelled diagram to show the electrorefining of impure copper. [5]
- (b) Give a balanced chemical equation for the reaction of copper with dilute nitric acid.
- (c) Calculate the percentage composition of oxygen in blue vitriol. (H = 1, O = 16, S = 32, Cu = 64)
- (ii) Write balanced chemical equations to show how sulphur dioxide is converted to oleum in the Contact process. [2]
- (iii) Sara is given four solutions P, Q, R and S with pH values 5, 9, 2 and 13 respectively. Which solution/s will: [2]
- have no effect on phenolphthalein.
 - give a reddish-brown precipitate with ferric chloride solution.
 - have molecules as well as ions.
 - turn universal indicator yellow.
- (iv) Define electronegativity. [1]

Question Paper 16

Christ Church School
PRELIMINARY EXAMINATION
CHEMISTRY
SCIENCE Paper -2STD : 10
DATE : 14 /01/2026
TIME : 2 hoursMAXIMUM MARKS :80
NO.OF QUESTIONS :08
NO.OF PRINTED SIDES :06

Answer 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 at the head of this paper is reading time allowed for writing the answers.

SECTION- I is compulsory. Attempt any four questions from 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 one correct answer to the questions from the given options:

[15]

(i) Carbon to carbon double bond is found in :

- (a) 2- butylene
- (b) Acetaldehyde.
- (c) Acetic acid.
- (d) Ethyl alcohol

(ii) Anode used during electroplating of spoon with Nickel is :

- (a) Pure nickel rod
- (b) Spoon
- (c) impure nickel plate
- (d) pure silver rod.

(iii) When OH^{-1} and SO_4^{-2} ions migrate to copper anode, then ions which is likely to discharge is:

- (a) OH^{-1}
- (b) SO_4^{-2}
- (c) both OH^{-1} and SO_4^{-2}
- (d) none of them will discharge.

(iv) The percentage of oxygen in aluminium sulphate $\text{Al}_2(\text{SO}_4)_3$ is : [Al=27, O =16, S =32]

- (a) 65.41 %
- (b) 56.14%
- (c) 56.92%
- (d) 58.56%

(v) The method by which the compounds of Ferric chloride can be prepared is :

- (a) neutralization,
- (b) direct combination
- (c) precipitation
- (d) metal + Acid

(vi) During electrolysis of copper sulphate solution; the colour of electrolyte does not fade if electrode used is :

- (a) platinum.
- (b) copper.

- (c) graphite
- (d) silver.

(vii) The empirical formula of butane is

- (a) C_2H_7
- (b) C_2H_5
- (c) C_4H_{12}
- (d) C_2H_8

(viii) The commercial nitric acid is yellowish in colour due to presence of dissolved:

- (a) carbon dioxide
- (b) sulphur dioxide
- (c) nitrogen dioxide
- (d) hydrogen sulphide.

(ix) The type of bond formed when the combining atoms have zero electronegativity difference is :

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

(x) The catalyst preferred in the conversion of sulphur dioxide to sulphur trioxide is :

- (a) Finely divided iron.
- (b) Graphite
- (c) Vanadium pentoxide.
- (d) Aluminium.

(xi) Consider the following ionic reaction : $Cu \rightarrow Cu^{+2} + 2e^-$. Identify at which electrode would above mentioned reaction takes place and whether it is an example of oxidation or reduction :

- (a) Cathode , Oxidation.
- (b) Anode , Oxidation.
- (c) Cathode , Reduction.
- (d) Anode , reduction.

(xii) The molecular formula of an organic compound with vapour density 15 and empirical formula is CH_3 is :

- (a) CH_4
- (b) C_2H_4
- (c) C_3H_6
- (d) C_2H_6

(xiii) A alloy which contain a non- metal in its composition :

- (a) Duralumin.
- (b) Stainless steel
- (c) Brass
- (c) Bronze

(xiv) Assertion (A) : HCl gas dissolves in water as well as organic compounds like toluene.
Reason (R) : HCl is a polar covalent compound.

- (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

(xv) Assertion (A) : Iron (II) salt solution when reacted with ammonium hydroxide forms a dirty green precipitate.

Reason (R) : Iron salts are brown in colour.

- (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) Give the structural formula of each of the following :

- (a) 2 - methyl propane [3]
 (b) 3-methyl butane-1-ol
 (c) 2 propanol.

(ii) A gas of mass 64 grams has a volume of 20 litres at S.T.P . Calculate the gram molecular mass of the gas . [2]

(iii) Identify the term in each of the following :

- (a) The energy required to remove an electron from a neutral isolated gaseous atom . [5]
 (b) The electrode connected to the positive terminal of the battery .
 (c) An alkane with eight carbon atom .
 (d) A nitrate not used in the laboratory preparation of ammonia.
 (e) A pair of electron which is not shared with any other atom.

(iv) Fill in the blanks from the choices given within the brackets :

- (a) The first homologue whose general formula is C_nH_{2n} is _____ [Ethene/ Ethyne] [5]
 (b) The drying agent used in the laboratory preparation of ammonia is _____ [CaO / CuO]
 (c) As we descend the electrochemical series containing cations, the tendency of cations to get _____ [oxidized / reduced] at the cathode increases.
 (d) The functional group in HCHO is _____ [alcohol / aldehyde]
 (e) _____ is produced when concentrated nitric acid reacts with sulphur [NO_2/SO_2]

(v) Identify the following radicals:

- (a) Forms while precipitate with $AgNO_3$ [5]
 (b) Forms while precipitate with $BaCl_2$ that does not dissolve in HNO_3 .
 (c) Forms a black precipitate with $AgNO_3$
 (d) Forms a Brown ring $FeSO_4$ and conc. H_2SO_4
 (e) Form a lilac pink flame .

(vi) Complete and balance the following chemical equations. [5]

- (a) $C + H_2SO_4 \rightarrow$
 [Conc]
 (b) $FeS + H_2SO_4 \rightarrow$
 [dil.]
 (c) $Zn + H_2SO_4 \rightarrow$
 [conc]
 (d) Acetic acid + Ethanol \rightarrow
 (e) $C_2H_4 + H_2O \rightarrow$

SECTION- II [Attempt any four questions] Marks : 40

Question 3

- (i) A hydrocarbon X contains 14.3 % of hydrogen and the remaining is of carbon : [4]
 (a) What is its empirical formula ?
 (b) If relative molecular mass of it is 28 what is its molecular formula ? Give IUPAC name.
 [H=1,C=12 , O=16]

(ii) Draw the electron dot diagram for the formation of Ammonia [At.no: N =7, H =1] [2]

(iii) Choose the answer from the list which fits the given description:
[NH₄OH , CO₂ , Fe(OH)₃ , Zn(NO₃)₂] [4]

- (a) A weak alkali.
- (b) An insoluble base.
- (c) An acidic oxide.
- (d) A salt which on heating gives yellow residue when hot and white when cold.

Question 4

(i) Identify which of the following terms match with the given descriptions:
[Dibasic acid , Weak acid, Hydra acid] [3]

- (a) An acid containing hydrogen and non-metallic element other than oxygen.
- (b) The type of acid which reacts with a base to give an acid salt and a normal salt.
- (c) An acid which dissociate to give a low concentration of H⁺ ions.

(ii) Give balanced chemical equations for the formation of the following with dilute HCl [3]

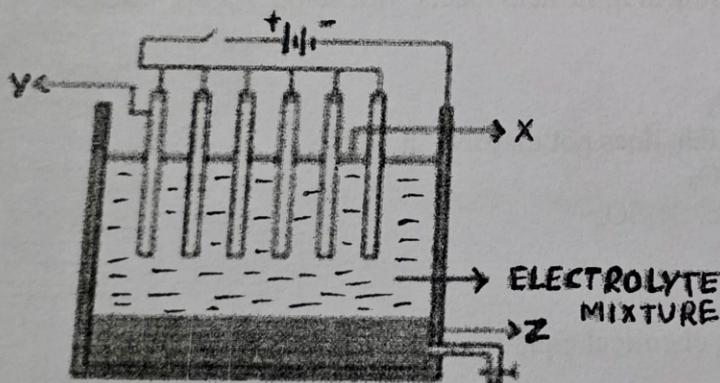
- (a) Hydrogen.
- (b) Carbon dioxide.
- (c) Sulphur dioxide.

(iii) Name the following : [4]

- (a) Third member of alcohol series.
- (b) The element which has highest electronegativity.
- (c) Second member of carboxylic acid . [IUPAC name]
- (d) The second last element of the third period.

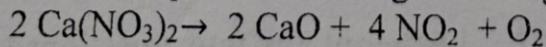
Question 5

(i) Following sketch illustrate the process of conversion of Alumina to Aluminium.:
Study the diagram and answer the following : [6]



- (a) Name the constituent of the electrolyte mixture which has a divalent metal in it .
- (b) Name the powder ' X ' sprinkled on the surface of the electrolyte mixture also write its function.
- (c) Write the reaction taking place at the electrode ' Y ' (anode) and ' Z ' (cathode).
- (d) Write the name of the process .

(ii) Calcium nitrate decomposes on heating according to the following chemical equation : [4]



[Ca =40 , O =16 , N = 14]

Calculate :

- (a) The volume of nitrogen dioxide obtained at STP
- (b) The mass of calcium oxide obtained when 16.4 g of calcium nitrate is heated.
- (c) The volume of Oxygen obtained at STP

Question 6

- (i) Give a suitable chemical term for the following : [3]
 (a) A bond formed by shared pair of electrons with both electrons coming from the same atom.
 (b) The process which involves extraction of metals by electrolysis of their fused salts.
 (c) An ore is heated in absence of air to the temperature that is high but insufficient to melt the ore.

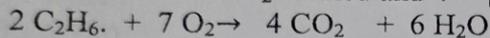
(ii) Complete the following by choosing the correct answers from the bracket: [5]

- (a) Ammonia in the liquified form is _____ [neutral / basic]
 (b) An inert electrode used in electrolysis of acidified water is _____ [iron/platinum]
 (c) The ore from which aluminium is extracted must be treated with _____ [NH₄OH/NaOH]
 (d) Ammonia can be obtained by the action of warm water on _____
 [Magnesium nitrate/magnesium nitride]
 (e) During electroplating the article to be electroplated is always placed at _____
 [cathode/anode]

(iii) A cylinder contains 68 gm of ammonia gas at S.T.P find the volume occupied by this gas .
 [At. wt : N=14 , H =1] [2]

Question 7

- (i) 2500 c.c of oxygen was burn with 600 c.c of ethane then calculate the volume of unused oxygen and volume of CO₂ formed . [At. wt : O=16 , H =1 , C=12] [3]



(ii) Complete the following table which refers to the application of electrolysis : [4]

	Anode (Material)	Cathode (Material)	Electrolyte	Reaction at cathode
Purification of copper				

(iii) Rohit was ask to arrange the following elements as directed in bracket, find out the correct answers written by him : [3]

- (a) Ar , He , Kr, Ne (increasing order of electron shell)
 (b) Li , F , C , O (increasing order of electron affinity)
 (c) Cl , Mg , P , Na (Increasing order of ionisation potential)

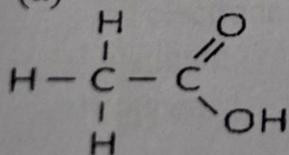
Question 8

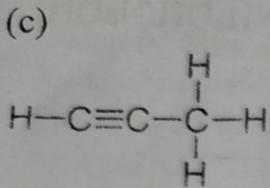
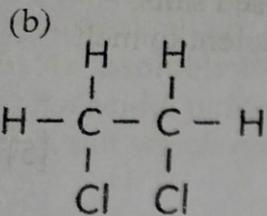
(i) Redraw the table and complete the answers : [5]

Name of the process	Temperature	Catalyst used	Equation of the reaction
Haber's process			
Ostwald Process [Catalytic chamber]		Platinum	

(ii) Name the following organic compounds : [3]

(a)





(iii) Write the balanced chemical equations given reactions :

[2]

- Calcium carbide with water .
- Sodium ethanoate with soda lime.



**PRELIMINARY EXAMINATION
CHEMISTRY**

CLASS: 10

TIME: 2 HRS

DATE: 14th January, 2026.

MARKS: 80

All questions in Section A are compulsory. Answer any four main questions only, from Section B. All sub-questions under each question must be answered in the correct order. Read the instructions carefully, before attempting the questions.

SECTION A (40 Marks)

(Attempt all questions from this Section)

Question 1

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

[15]

- (i) The metal hydroxide that reacts with both acids and alkalis to form salt and water is
- | | |
|-------------------------|-------------------------|
| (a) Calcium hydroxide | (c) Magnesium hydroxide |
| (b) Aluminium hydroxide | (d) Ferric hydroxide |
- (ii) Copper, Zinc and Tin are the metals alloyed to form
- | | |
|---------------|------------|
| (a) Duralumin | (c) Brass |
| (b) Solder | (d) Bronze |
- (iii) Assertion (A) : Alkali metals do not form dipositive ions.
Reason (R) : After the loss of one electron, alkali metals achieve a stable electronic configuration of noble gases.
- | |
|--|
| (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. |
- (iv) During the electrolysis of molten lead bromide, which of the following takes place?
- | |
|---|
| (a) Bromine is released at the cathode. |
| (b) Lead is deposited at the anode. |
| (c) Bromine ions gain electrons. |
| (d) Lead is deposited at the cathode. |
- (v) Dilute sulphuric acid and concentrated sulphuric acid can be distinguished by :
- | | |
|------------|--------------|
| (a) Copper | (c) Silver |
| (b) Gold | (d) Platinum |

- (vi) Hydrogen chloride gas being highly soluble in water is dried by
(a) Anhydrous calcium chloride (c) Quicklime
(b) Phosphorous pentoxide (d) Conc. Sulphuric acid
- (vii) The IUPAC name of acetylene is
(a) Propyne (c) Propane
(b) Ethene (d) Ethyne
- (viii) The hydroxide which is soluble in excess NH_4OH is
(a) Ferric hydroxide (c) Copper hydroxide
(b) Lead hydroxide (d) Calcium hydroxide
- (ix) Electron affinity is maximum in
(a) Mg (c) Li
(b) Ar (d) Br
- (x) Ammonia can be obtained by adding water to
(a) NH_4Cl (c) $\text{Mg}(\text{NO}_3)_2$
(b) Mg_3N_2 (d) $(\text{NH}_4)_2\text{SO}_4$
- (xi) Which of the following would occupy 22.4 litres at STP?
1) 32 g of oxygen gas,
2) 2 moles of hydrogen gas,
3) 6.023×10^{23} molecules of ammonia
[Atomic weights : O = 16, H = 1, N = 14]
(a) 1 & 2 (c) 2 & 3
(b) 1 & 3 (d) 1, 2 & 3
- (xii) Assertion (A) : Carbon monoxide will not produce an acid when made to react with water.
Reason (R) : Carbon monoxide is a neutral oxide
(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.
- (xiii) Among the following compounds, identify the compound that has all three bonds (ionic, covalent and coordinate bonds).
(a) Ammonia (c) Ammonium chloride
(b) Sodium hydroxide (d) Calcium chloride

- (xiv) Which of these will act as a non- electrolyte?
 (a) Liquid carbon tetrachloride (c) Aqueous sodium hydroxide
 (b) Acetic acid (d) Aqueous potassium chloride
- (xv) Identify one statement that does not hold true for the electrorefining of copper
 (a) Electrolyte is acidified CuSO_4 solution
 (b) Cathode is a thin strip of impure copper
 (c) Anode dissolves in the electrolyte
 (d) Anode gets thinner.

Question 2

- (i) (a) Give a difference between ionization and electrolytic dissociation. [5]
 (b) 112 ml of a gaseous fluoride of a non-metal Phosphorus at STP has a mass of 0.63 g. Calculate the relative molecular mass of the fluoride.
 (c) If this compound given in (b) has only one atom of Phosphorus, then determine its formula. [At. Wt. P = 31, F = 19]

- (ii) Match Column A with Column B [5]

COLUMN A

- (a) Acid salt
 (b) Manganese dioxide
 (c) Lead hydroxide
 (d) Ferric hydroxide
 (e) Polar compound

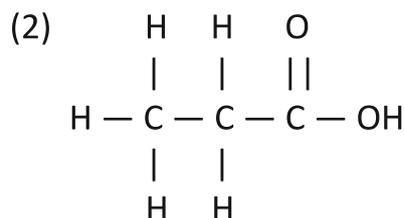
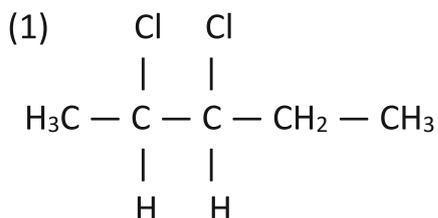
COLUMN B

- (i) Black in colour
 (ii) Brown precipitate
 (iii) Hydrogen chloride
 (iv) Calcium hydrogen carbonate
 (v) Soluble in excess sodium hydroxide

- (iii) Complete the following by choosing the correct answers from the bracket: [5]
 (a) HCl in the liquefied form is _____. (neutral/acidic)
 (b) Organic compounds are generally soluble in _____. (water/organic solvents)
 (c) An inert electrode used in the electrolysis of copper sulphate solution is _____. (copper/platinum)
 (d) Hydrocarbons having triple bond is _____. (alkenes/alkynes)
 (e) An acidic gas gives dense white fumes of _____ ($\text{NH}_4\text{OH}/\text{NH}_4\text{Cl}$) with ammonia.

- (iv) Identify the following : [5]
 (a) A bond formed between two atoms by sharing a pair of electrons, with both electrons being provided by the same atom.
 (b) A salt formed by the complete neutralisation of an acid by a base.
 (c) The energy required to remove an electron from a neutral gaseous atom.
 (d) The catalyst used in the Ostwald's process.
 (e) The process of heating the concentrated ore in limited supply or absence of air.

(v) (a) Give the IUPAC names of the organic compounds represented by the [5]
structural formulae given below :



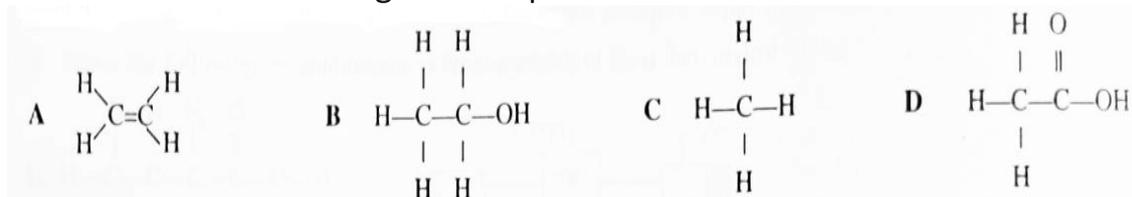
(c) Draw the structural diagram for the following organic compounds :

- (1) 3-methyl butane (2) 3-chloro-2-methyl butanoic acid
(3) 2-pentene

SECTION B (Answer any 4 questions)

Question 3

(i) The formulae of some organic compounds are : [3]



(a) Write an equation for the preparation of A using B.

(b) Name the compound formed when B and D react in the presence of a mineral acid.

(c) Write an equation for the preparation of C using soda lime.

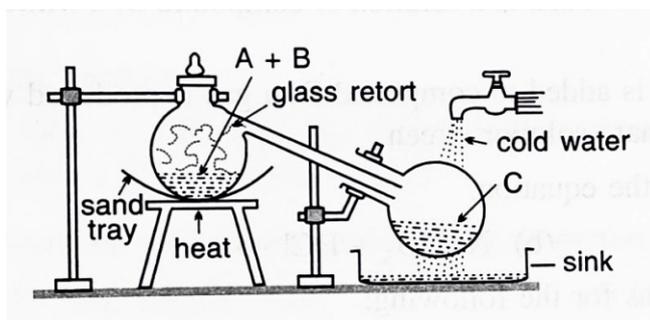
(ii) Arrange the following as per instructions given in brackets : [3]

(a) Carbon, Fluorine, Beryllium (decreasing order of atomic size)

(b) Sulphuric acid, phosphoric acid, acetic acid (increasing order of number of replaceable H atoms per molecule)

(c) Potassium, Lithium, Sodium (increasing order of ionisation potential)

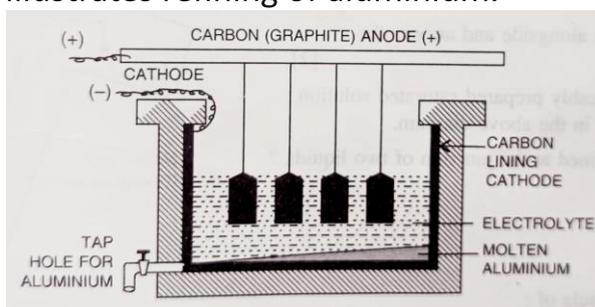
(iii) The figure given below illustrates the apparatus used in the laboratory preparation of nitric acid. [4]



- (a) Name A (a liquid) and B (a solid). (Do not give the formulae)
 (b) Write a balanced chemical equation for the above preparation.
 (c) Why is an all glass apparatus used?
 (d) C prepared is yellow in colour. Why?

Question 4

- (i) Atom Y has 2 electrons in its N shell, Atom X has 7 electrons in its M shell and Atom Z has 6 electrons in its neutral state. Answer the following questions: [3]
- (a) Which atom is likely to form a cation?
 (b) What is the formula of the compound formed between X and Z ?
 (c) Draw the electron dot diagram of the compound of X and Y ?
- (ii) State your observation when : [3]
- (a) Ethylene gas is passed through bromine water.
 (b) Silver nitrate solution is added to hydrochloric acid.
 (c) Ammonia gas is passed over heated PbO.
- (iii) The diagram illustrates refining of aluminium. [4]



- (a) Write the reactions taking place at the cathode and the anode.
 (b) What is the electrolyte in the tank?
 (c) What is the role played by the constituents of the electrolyte?

Question 5

- (i) Write balanced equations for the following reactions : [3]
- (a) Lead[II] oxide and caustic potash.
 (b) Copper[II] oxide and dilute sulphuric acid.
 (c) Action of conc. sulphuric acid on phosphorus.
- (ii) Give reasons for the following : [3]
- (a) Covalent compounds have a low melting and boiling point.
 (b) Atoms with large atomic radii and low ionisation potential are more metallic in nature.
 (c) Atomic size decreases across a period but increases down a group of the periodic table.

- (iii) With respect to the industrial manufacture of sulphuric acid, answer the following questions: [4]
- (a) Name the process.
 - (b) Give the reaction for the catalytic oxidation of sulphur dioxide in the 2nd step. Mention the conditions required for the same.
 - (c) Write the reaction that follows the step above. Name the product formed.

Question 6

- (i) Give balanced chemical equations for the following : [3]
- (a) Action of warm water on aluminium nitride.
 - (b) Oxidation of carbon with concentrated nitric acid.
 - (c) Laboratory preparation of ethanol by using chloroethane and aqueous sodium hydroxide.
- (ii) On analysis, a substance was found to contain C = 54.54%, H = 9.09% and O = 36.36%. The vapour density of the substance is 44, calculate : (a) its empirical formula, (b) its molecular formula. [C = 12, H = 1, O = 16] [3]
- (iii) (a) Define : (1) Mole (2) Gay – Lussac's law [4]
(b) Name the product formed in the following :
(1) Catalytic hydrogenation of ethyne
(2) Oxidation of ethanol using acidified $K_2Cr_2O_7$

Question 7

- (i) (a) State the factors that affect the electronegativity of an element in the periodic table. [3]
(b) Explain the trend in electron affinity down a group in the periodic table.
- (ii) Rohit has solution X, Y and Z that has pH 2, 7 and 13 respectively. Which solution: [3]
(a) will liberate sulphur dioxide gas when heated with sodium sulphite?
(b) Will liberate ammonia gas when reacted with ammonium chloride?
(c) Will not have any effect on litmus paper?
- (iii) Aluminium carbide reacts with water according to the equation : [4]
- $$Al_4C_3 + 12H_2O \rightarrow 4Al(OH)_3 + 3CH_4$$
- (a) State what mass of aluminium hydroxide is formed from 12g of aluminium carbide.
 - (b) State the volume of methane at STP, obtained from 12 g of aluminium carbide. [relative molecular weight of $Al_4C_3 = 144$, $Al(OH)_3 = 78$]

Question Paper 18

ST. PETER'S SCHOOL, MAZAGAON, MUMBAI - 10
PRELIMINARY ASSESSMENT 2025 - 26
CHEMISTRY
(SCIENCE PAPER-2)

STD : 10

DATE: 19/01/2026

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 first 15 minutes.

This time is to be spent in reading the question paper.

The time given at the head of this Paper is the time allowed for writing the answers.

Section A is compulsory. Attempt any four questions from Section B.

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

Section A (40 marks)

(Attempt all questions from this section)

[15]

Question 1.

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

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

(i) The element which has three shells and one valence electron is

- (a) Chlorine (b) Sodium (c) Potassium (d) Hydrogen

(ii) The number of atoms present in one mole of Hydrogen gas is

- (a) 2 (b) 6.023×10^{23} (c) 3 (d) $2 \times 6.023 \times 10^{23}$

(iii) Which of the following alloys is used for welding purpose?

- (a) Brass (b) Solder (c) Gun metal (d) Duralumin

(iv) Which pair of elements listed below will undergo ionic bond formation?

- (a) Na and K (b) N and H (c) K and O (d) C and Cl

(v) The process due to which an ionic compound in fused state or aqueous solution dissociates into ions is called

- (a) Ionisation. (b) Decomposition (c) Dissociation. (d) Degradation

(vi) The colour change observed when alkaline phenolphthalein is added to acids is

- (a) Remains colourless. (b) Pink to colourless.
(c) Colourless to pink. (d) Remains pink

(vii) The inert electrode used in the electrolysis of acidified water is

- (a) Nickel (b) copper
(c) Platinum (d) silver

(viii) The functional group present in the organic compound Pentanal is

- (a) CHO (b) COO- (c) CO (d) COOH

(ix) The mass of given volume of gas compared to mass of equal volume of Hydrogen gas is termed as
 (a) Molar volume (b) Vapour density (c) Molar mass (d) density

(x) An aqueous solution of ammonia is
 (a) Neutral (b) Acidic
 (c) Basic (d) Amphoteric

(xi) An organic compound, which undergoes substitution reaction, is
 (a) C_2H_2 . (b) C_2H_4 . (c) $C_{10}H_{18}$. (d) C_2H_6

(xii) The acid, which is least volatile, is
 (a) Hydrochloric acid. (b) nitric acid. (c) dil. sulphuric acid (d) conc sulphuric acid

(xiii) The acidity of aluminium hydroxide is
 (a) 3 (b) 1 (c) 4 (d) 2

(xiv) Assertion (A): Alkenes, alkynes and alkanes are examples of homologous series.

Reason (R): Organic compounds of the homologous series have similar structures but different chemical properties.

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

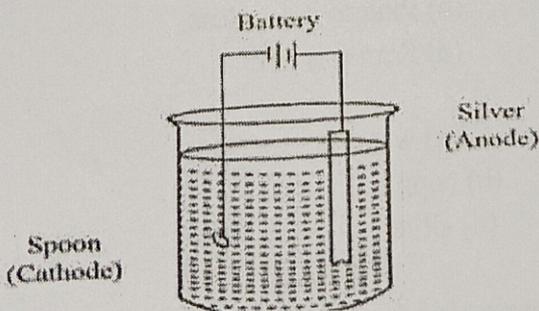
(xv) Assertion (A): Few drops of dilute acid is added to a solution of zinc sulphide, a colourless gas is formed with a rotten egg odour.

Reason (R): Gas formed does not turn moist lead acetate paper silvery black.

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

Question 2

(i) The diagram below shows electroplating with silver. Study the diagram and answer the questions. [5]



- (a) Name the electrolyte used
- (b) Write the reaction taking place at the cathode and anode
- (c) State the product formed at the cathode and anode

- (ii) Match the following - Column A with Column B. [5]

Column A	Column B
(a) Ammonia	1. Electrovalent compound
(b) Magnesium oxide	2. Sulphide ore
(c) Conc. Sulphuric acid	3. Haber's process
(d) Froth flotation	4. Covalent compound
(e) Carbon tetra chloride	5. Dehydrating agent

- (iii) Complete the following sentences by choosing the correct answers from the brackets. [5]

- (a) If an element has one valence electrons then it is likely to have the ____ (smallest/largest) electron affinity among all the elements in the same period.
- (b) _____ (Acetic acid / phosphoric acid) forms two acidic salts.
- (c) A _____ (Chalky/gelatinous) white precipitate is formed when NaOH is added to a solution of zinc sulphate
- (d) _____ (Alkynes/ Alkanes) undergo characteristic addition reaction.
- (e) _____ (Conc. Sulphuric acid/Conc. Nitric acid) is dehydrating as well as a drying agent

- (iv) Identify the following. [5]

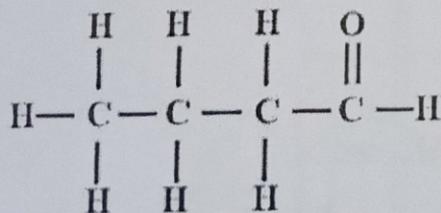
- (a) A salt formed by the incomplete neutralization of an acid by a base.
- (b) A reaction in which the hydrogen of an alkane is replaced by a halogen.
- (c) The energy required to remove an electron from a - neutral gaseous atom.
- (d) The distance between the centre of the nucleus of an atom and its outermost shell.
- (e) A salt formed by partial replacement of hydroxyl radicals of a diacidic or triacidic base with an acid radical

- (v) (a) Draw the branched structural formula for the following compounds: [5]

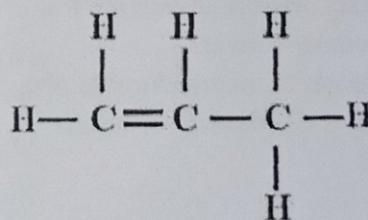
- 2, 2-Dibromo Propane
- 2-Pentyne
- Butanoic acid

- (b) Give the IUPAC name of the following organic compound:

1.



2.

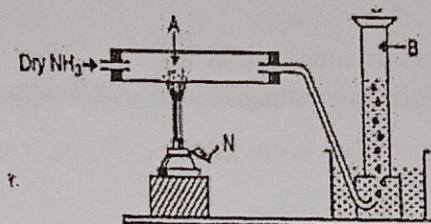


SECTION B

(Attempt any four questions from this Section.)

Question 3

- i. Identify the reactant and write a balanced equation for the following: [2]
Hydrochloric acid reacts with a compound Z to give a salt $MgCl_2$, water and sulphur dioxide.
- ii. What property of ammonia is exhibited in each of the following cases: [2]
a) Its aqueous solution reacts with salt solution of Fe^{2+} ion producing a precipitate and a soluble salt.
b) A buff yellow lead [II] oxide reacts with ammonia in a combustion tube.
- iii. In a reaction between X and Y, element X gains electrons and element Y loses electrons. It is known that X is more electronegative. [3]
a) Which element behaves as a stronger reducing agent?
b) Which element has lower electron affinity?
c) State whether Y is likely to be placed to the left or to the right of X in the periodic table
- iv. Dry ammonia gas is passed over black substance as shown in the figure below: [3]



- (a) Name the black substance A and the gas evolved B.
(b) Write a balanced equation for the reaction of ammonia with A.

Question 4

- i. The following questions relate to the extraction of Aluminium: [2]
a) Name the chemicals added to the electrolytic mixture.
b) A layer of powdered coke is sprinkled over the electrolytic mixture. Give reason.
- ii. Calculate the moles of sodium hydroxide contained in 160g of it [Na=23, O=16, H=1] [2]
- iii. Write the balanced chemical equation for each of the following: [3]
a) Action of conc. sulphuric acid on sugar
b) Catalytic oxidation of ammonia.
c) Dehydrohalogenation of 1, 2-Dibromo ethane with alcoholic potassium hydroxide.
- iv. With respect to contact process answer the following: [3]
a) Catalyst used in the contact tower.
b) Substance added to water to manufacture sulphuric acid.
c) Balanced equation for the formation of oleum.

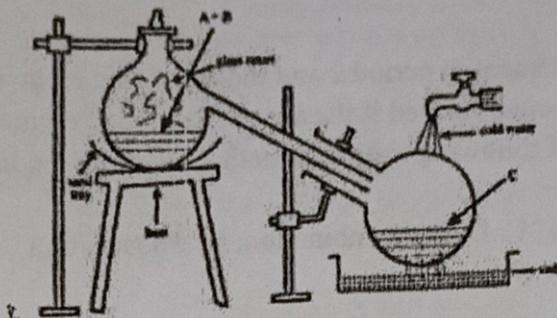
Question 5

- i. Calculate the amount of each reactant required to produce 750 ml of carbon dioxide as per the equation . [2]
$$2CO + O_2 \rightarrow 2CO_2$$
- ii. Give one use of the alloy which is having the following metals as its main component: [2]
a) Aluminium. b) Iron.

iii. State scientific reasons for each of the following statements: [3]

- a) Inert gas do not form ions
- b) Ionic compound have a high melting point
- c) Conductivity of dilute hydrochloric acid is greater than that of acetic acid

iv. Study the figure given and answer the following questions. [3]



- a) Identify 'C'
- b) Name the reactants used
- c) Write the balance chemical reaction showing the formation of 'C'

Question 6

i. State the relevant reason for the following. [2]

a) Concentrated alkali is used for the concentration of bauxite ore

b) Fused alumina is reduced to aluminium by electrolysis

ii. State one observation when Ammonium hydroxide solution is added drop by drop and then in excess to each of the following: [2]

a) copper sulphate solution.

b) zinc sulphate solution.

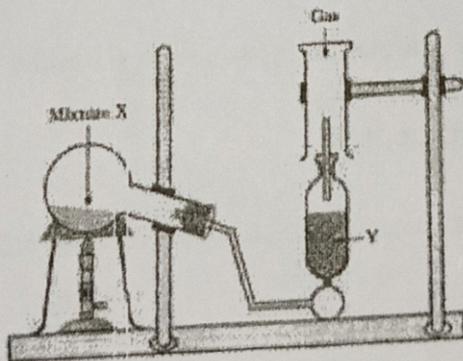
iii. Molten lead bromide is electrolysed using graphite electrodes. [3]

a) State observation seen at the anode

b) The electrolytic cell is made of silica and the crucible is heated slowly from outside. Give reason

c) Write the reaction that takes place at anode.

iv. The diagram shows an experimental set up for the laboratory preparation of a pungent smelling gas. The gas is alkaline in nature. [3]



(a) Name the gas collected in the jar.

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

(c) How is the gas being collected?

i. The empirical formula of an organic compound is CHCl_2 and its molecular weight is 168. Find the molecular formula. [Atomic weights; C-12; H-1; Cl-35.5] [2]

ii. Trikey prepared a solution R that has a pH 7. [2]

What will be the effect on the pH on addition of the following?

a) Sodium hydroxide solution.

b) An acidic solution.

iii. Which is the most electronegative element in period 2 and most metallic element in period 3? State the formula of the compound formed if the above mentioned elements reacts chemically [3]

iv) Choose the method of preparation of following salt from method given in the list and write the balanced chemical equation. [3]

List - A: Neutralization; B: Precipitation; C: Direct combination; D: Substitution

(a) Calcium carbonate

(b) Zinc sulphate

(c) Sodium sulphate

Question 8

i. Differentiate between the following on the basis of the parameters given in the brackets: [2]

a) Ferrous sulphate and ferric chloride (Sodium hydroxide solution)

b) Hydrochloric acid and sulphuric acid (addition of barium chloride)

ii. Draw the electron dot structure for: [2]

a) ammonium ion

b) polar covalent molecule having two pair of electrons.

iii. Write the balanced chemical equation for the following: [3]

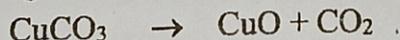
a) Laboratory preparation of ammonia from magnesium nitride.

b) Conversion of ethyl alcohol to ethyl ethanoate.

c) Complete oxidation of ethane.

iv. 12.6g of Copper oxide is obtained on thermal decomposition of copper

carbonate. [Atomic weights: Cu-63.5; C-12; O-16]. [3]



Calculate the following:

a) Mass of copper carbonate initially taken.

b) Volume of carbon dioxide at STP

CHEMISTRY
(SCIENCE PAPER - 2)
Preliminary Examination 2, 2025-26
(Two Hours)

GRADE: X

Maximum Marks: 80

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

You will not be allowed to write during the first 10 minutes.

This time is to be spent in reading the question paper.

The time given at the head of this Paper is the time allowed for writing the answers.

Section A is compulsory. Attempt any four questions from section B.

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

Instruction for the Supervising Examiner

Kindly read aloud the Instructions given above to all the candidates present in the Examination Hall.

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. A compound M is heated with concentrated sulphuric acid. A pungent smelling gas is evolved which turns moist blue litmus paper red. Which of the following could compound M be?
- | | |
|--------------------|----------------------|
| a. Sodium sulphate | b. Calcium carbonate |
| c. Sodium chloride | d. Zinc nitrate |
- ii. Which of the following is a weak electrolyte?
- | | |
|--------------------------------|--------------------------------|
| a. Sodium hydroxide solution | b. Dilute sulphuric acid |
| c. Potassium chloride solution | d. Ammonium hydroxide solution |
- iii. Assertion (A): Molten sodium chloride conducts electricity.
Reason (R): In the molten state, sodium chloride contains free moving ions.
- | |
|--|
| 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. |
- iv. Identify the molecule that contains two lone pairs of electrons.
- | | |
|------------------|-------------------------|
| a. NH_3 | b. H_2O |
| c. CH_4 | d. HCl |
- v. ' ACl_2 ' is the formula of an electrovalent solid. If 'A' is placed in period 2 and group 2 of the modern periodic table then element 'A' is:
- | | |
|-------|-------|
| a. Mg | b. Be |
| c. C | d. Li |

Question 2

Complete the following by choosing the correct answers from the bracket:

[5]

- Electrolysis of acidified water produces _____ (hydrogen / oxygen) gas at twice the volume of the other gas.
- Covalent compounds are _____ (good / bad) conductors of heat.
- During the electrolysis of water, a small amount of _____ (sugar / acid) is added to increase its conductivity.
- In the electrolysis of copper (II) chloride solution, the gas released at the electrode is _____ (hydrogen / chlorine).
- Nitrogen is _____ (polar / non-polar) covalent compound.

ii. Arrange the following as per the instructions given in the brackets.

[5]

- B, N, O, C (increasing order of atomic size)
- F, O, N, C (decreasing order of non-metallic character)
- Li, Be, B, C (increasing order of ionisation potential)
- Ne, F, N, O (increasing order of electron affinity)
- Cl, I, F, Br (decreasing order of electronegativity)

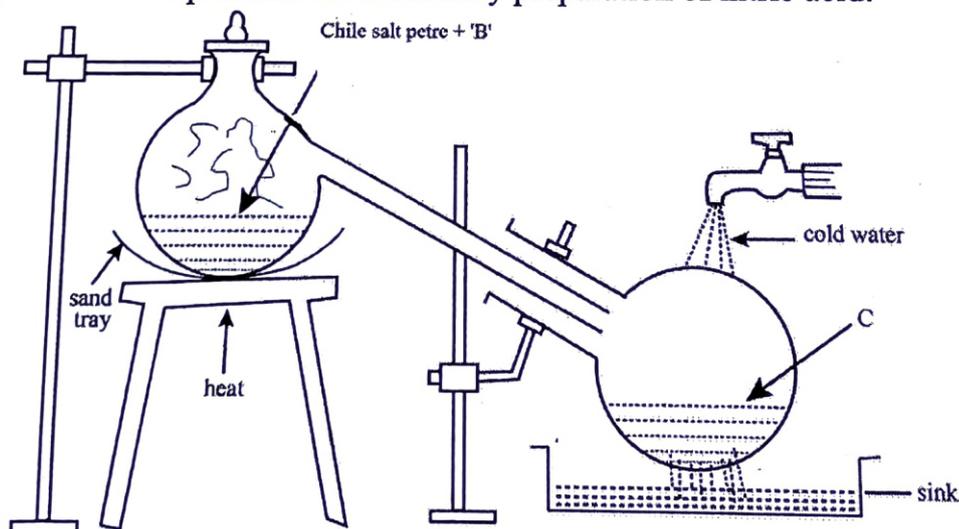
iii. Match the following.

[5]

Column 'A'	Column 'B'
a. Molar Mass of Water	1. CaO
b. Volume of 1 mole of any gas at STP	2. NaOH
c. Acidic oxide	3. 18 g/mol
d. Base formed by metal oxide	4. SO ₂
e. Hydroxide that turns litmus paper blue	5. 22.4 L

iv. The diagram below represents the laboratory preparation of nitric acid.

[5]



- Identify the liquid reactant 'B' and write balanced chemical equation for this process.
- Why is the receiver kept in a cold-water bath?
- Explain why high temperatures are not used in this process.

v. Answer the following.

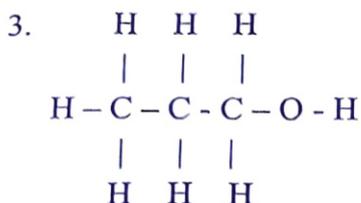
a. Draw the structural formula for the following compounds: [2]

1. Bromomethane
2. Ethanol

[3]

b. Write IUPAC names of the following:

1. H-COOH
2. CH₃-CH=CH-CH₂-CH₃



SECTION B (40 Marks)

(Attempt any four questions.)

Question 3

- i. Ravi has three solutions P, Q and R with pH 1, 7 and 11 respectively. Which solution: [3]
 - a. will liberate carbon dioxide gas when heated with sodium carbonate?
 - b. will turn litmus paper blue?
 - c. will not change the colour of methyl orange?
- ii. What is sodalime and why it is preferred over NaOH in laboratory preparation of alkanes? [2]
- iii. Explain why electrovalent compounds have high melting and boiling points. [2]
- iv. Draw the electron dot structure of following ions. [3]
 - a. Ammonium ion
 - b. Hydronium ion
 - c. Hydroxide ion

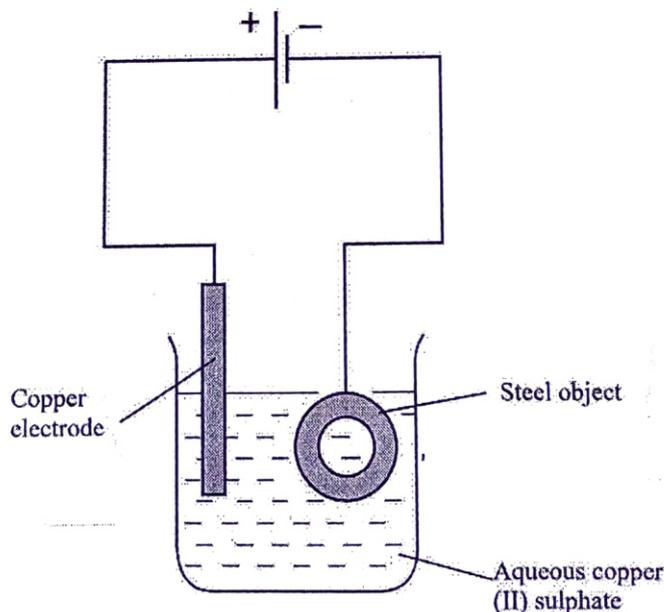
Question 4

- i. Explain how will you distinguish between Iron (II) sulphate and Iron (III) chloride solutions using sodium hydroxide solution? [2]
- ii. Name the main metal present in the following alloys: [2]
 - a. Bronze
 - b. Stainless steel
- iii. Answer the following questions pertaining to the laboratory preparation of ethene. [3]
 - a. Name the method used and write its balanced chemical equation.
 - b. Mention one observation made during the collection of product.
- iv. Write the basicity or acidity of the following: [3]
 - a. Acetic acid
 - b. Aluminium hydroxide
 - c. Sulphuric acid

- i. The ionization energy of element A is less than that of element B. Base on this, answer the following. [3]
 - a. How is the metallic character of A likely to compare with that of B?
 - b. How is the atomic size of A likely to compare with that of B?
 - c. State whether A is likely to be placed above or below B in the same group of the periodic table?
- ii. P, Q and R are three elements with atomic numbers 11, 17 and 18 respectively. Answer the following questions using only the alphabets given. Do not identify the elements. [2]
 - a. Which element forms a stable diatomic molecule in gaseous state?
 - b. Which element has completely filled outermost shell?
- iii. You are given freshly prepared lime water and acidified KMnO_4 solution. Which of these reagents is most suitable for distinguishing between CO_2 and SO_2 ? Justify your answer. [2]
- iv. Choose the method of preparation of the following salts from the methods given in the list below: [3]
 - Direct combination
 - Precipitation
 - Neutralisation of insoluble base
 - Titration
 - a. Lead [II] chloride
 - b. Zinc sulphide
 - c. Lead nitrate

Question 6

- i. What will be the mass of sulphur dioxide that will contain the same number of molecules as present in 4.4g of carbon dioxide gas? [At. Wt: C=12, O=16, S=32] [2]
- ii. Electroplating a steel object with copper involves using copper electrodes. Study the given diagram and answer the questions that follow: [4]



- a. Which type of reaction takes place at cathode, oxidation or reduction?

- b. Explain why the anode dissolves during the given process.
- c. Give any two factors that affect the rate of electroplating.
- iii. Identify the reactant and write the balanced equation for the following: [2]
Hydrochloric acid reacts with compound R to give a salt Magnesium chloride, water and carbon dioxide.
- iv. Write the IUPAC names for the products obtained when each of the following undergoes chlorination. [2]
 - a. Ethene
 - b. Ethyne

Question 7

- i. Write the balanced chemical equations for the manufacture of sulphuric acid by contact process in following: [4]
 - a. Sulphur or pyrite burners
 - b. Contact tower
 - c. Absorption tower
 - d. Dilution tank
- ii. Solid calcium carbonate decomposes as under: [3]
 $\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$
If 50g of calcium carbonate decomposes, calculate:
 - a. The number of moles of calcium carbonate that undergoes decomposition.
 - b. The mass of calcium oxide formed at the same time.
 - c. The volume of carbon dioxide gas evolved at STP. [At. Wt: Ca=40, C=12, O=16]
- iii. In metallurgy, reduction of metallic oxides to its metal can be done by various methods. Name these methods for the following oxides. [3]
 - a. Aluminium oxide
 - b. Zinc oxide
 - c. Mercuric oxide

Question 8

- i. Name any two oxidising agents that can oxidise conc. HCl. [2]
- ii. Why does the water rise in the tube during the fountain experiment? Explain how this is related to the solubility of HCl gas in water. [2]
- iii. Answer the following. [3]
 - a. Copper vessels are not considered as pure copper. Give a reason.
 - b. Name the ore from which iron is primarily extracted. Also write its formula.
- iv. Neha heated 6.0 grams of element 'A' (At. Wt. 24) with 8.0 grams of element 'B' (At. Wt. 32) to form a compound. Find the empirical formula of the compound obtained by Neha. [3]

Question Paper 20

GREENLAWNS HIGH SCHOOL
PRELIMINARY EXAMINATION
CHEMISTRY
X - 20/01/26

Maximum Marks: 80

Time allowed: Two hours

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

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)

Question 1

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

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

[15]

(i) As we move across a period, hydroxides of the elements change from.

- (a) strongly acidic to amphoteric to basic
- (b) weakly basic to amphoteric to strongly acidic
- (c) strongly amphoteric to basic to acidic
- (d) strongly basic to amphoteric to acidic

(ii) Non-polar covalent bonds are formed between

- (1) identical atoms
- (2) hydrocarbons
- (3) metal and non-metal
- (4) metal and metal

- (a) all of the above (b) 1 and 2 only
 (c) 1, 2 and 3 (d) 3 and 4

(iii) Assertion (A) : Most of the acids dissolve in water.

Reason (R) : pH of an acid is less than 7.

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

(iv)

Test	Observation
Zn ²⁺ treated with excess of NH ₄ OH.	Colourless is solution formed due to formation of 'A'
Zn ²⁺ treated with excess of NaOH.	Colourless is solution formed due to formation of 'B'

- (a) A – Tetrammine zinc sulphite B – Sodium zincate
 (b) A – Sodium zincate B – Tetrammine zinc sulphate
 (c) A – Tetrammine zinc sulphate B – Sodium zincate
 (d) A – Tetrammine zinc sulphate B – Sodium zinc oxide

(v) A compound with empirical formula XY₂ has vapour density twice its empirical formula. Its molecular formula is

- (a) X₂Y₂ (b) X₄Y₈
 (c) X₈Y₄ (d) X₄Y₄

(vi) Which of the following is true about electrolysis of CuSO_4 using platinum electrodes.

(1) The blue colour of the electrolyte fades.

(2) The anode decreases in size.

(3) The anode increases in size.

(4) The coloured gas is liberated at anode.

(a) only 2

(b) 1 and 4

(c) only 1

(d) 1 and 3

(vii) Earthly impurities are removed from the ore by adding

(a) flux

(b) gangue

(c) slag

(d) none of these

(viii) In contact process temperature is maintained at 450°C due to

(a) oxidation of S

(b) oxidation SO_2

(c) catalytic oxidation of SO_2

(d) oxidation of SO_3

(ix) Nature of liquid ammonia is

(a) basic

(b) acidic

(c) amphoteric

(d) neutral

(x) Fuming nitric acid is obtained by carrying out distillation .

(a) under low pressure and presence of dilute H_2SO_4

(b) under low pressure and presence of concentrated H_2SO_4

(c) under high pressure and presence of dilute H_2SO_4

(d) under high pressure and presence of concentrated H_2SO_4

- (xi) Hydrolysis of _____ with steam gives ethanol as one of the product.
- (a) ethyl hydrogen sulphate (b) ethyl sulphate
(c) methyl hydrogen sulphate (d) ethyl sulphite
- (xii) One mole of sulphuric acid produces how many hydronium ions.
- (a) 6.023×10^{23} (b) 12.046×10^{23}
(c) 3.0115×10^{23} (d) 1.50575×10^{23}
- (xiii) Electron affinity is 1 to atomic size and 2 to nuclear charge.
- (a) 1. directly proportional 2. inversely proportional
(b) 1. inversely proportional 2. directly proportional
(c) 1. directly proportional 2. directly proportional
(d) 1. inversely proportional 2. inversely proportional
- (xiv) Alkalis react with ammonium salts on heating to liberate
- (a) NH_3 (b) NH_4
(c) NO_2 (d) NO
- (xv) Ethanol is a good solvent for
- (a) S but not P (b) only S
(c) only P (d) both S and P

Question 2

- (i) Identify the following : [5]
- (a) Alloy of Cu and Zn which can be easily cast.
(b) Preferred electrolyte during electroplating with Silver.

- (c) The relative molecular mass of a substance expressed in gram.
- (d) Base used in the production of bleaching powder.
- (e) A cyclic compound which contain carbon along with other atom.

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

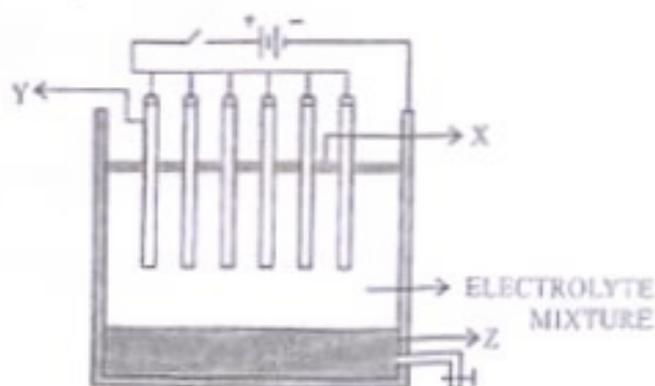
- (a) Gas released-when zinc sulphide reacts with dil. H_2SO_4 is _____.
(H_2S / SO_2)
- (b) Cation which gives pink salt is _____ (Mn^{2+} / Ni^{2+})
- (c) CH_3COOH reacts with _____ $FeCl_3$.to give wine red colour.
(neutral. / acidified.)
- (d) Covalent compound is formed when electronegativity is _____
(high / negligible).
- (e) Amalgam is obtained when an alloy of a metal is mixed with ____
(Mg / Hg)

(iii) Match the following [5]

- | | |
|----------------------|--|
| (1) Al_2O_3 to Al | a. brilliant white flame |
| (2) SO_2 to SO_3 | b. ion ^{atom} oxidised to atom ^{ion} |
| (3) Anode | c. ion reduced to atom |
| (4) Cathode | d. catalytic oxidation |
| (5) acetylene | e. electrolytic reduction |

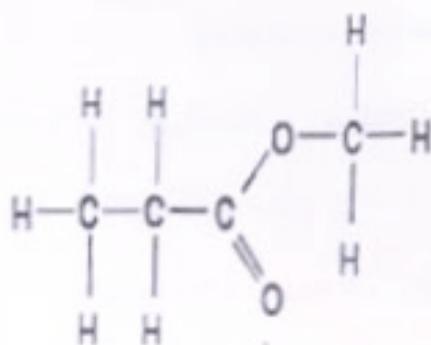
The diagram below shows the electrolytic cell for the extraction of aluminum from its ore by Hall-Heroult's process

[5]

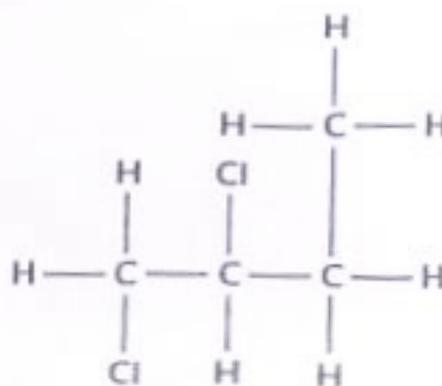


- (a) Write the composition of electrolyte mixture.
- (b) Give temperature and voltage to be maintained.
- (c) Write the anode and cathode reaction for the process.
- (d) Why anode needs to be replaced from time to time?
- (v) (a) Draw the branched structural formula for each of the following : [5]
1. 3 - methyl pent - 2 - ene
 2. 2 - butyne
 3. 2 - iodo - 2 - methyl propane
- (b) Write the IUPAC name for the following compounds :

1.



2.



SECTION B

(Attempt any four questions)

Question 3

- (i) Give one significant observation when: [2]
- (a) When manganese dioxide is heated with conc. HCl.
 - (b) Dry ammonia gas is burnt in excess of oxygen gas.
- (ii) Give reasons: [2]
- (a) Liquid ammonia is evaporated in ice plants to form ice from water.
 - (b) Conc. HNO_3 cannot be used in preparation of HCl gas in laboratory.
- (iii) Two elements X [2,4] and Y [2,8,7] combines to form a compound [3]
- (a) Formula of the compound formed.
 - (b) Type of bond formed between X and Y.
 - (c) Compound formed is polar or non-polar.
- (iv) Write balanced chemical equations for the following reactions: [3]
- (a) Copper oxide reacts with ammonia.
 - (b) Sulphur is treated with hot conc. HNO_3 .
 - (c) Hydrogen iodide is reacted with conc. H_2SO_4 .

Question 4

- (i) Name the main metal present in the following alloys: [2]
- (a) Duraliumin
 - (b) Solder

(ii)

Write the balanced chemical equations for the following:

.[2]

- (a) Reaction of phosphorus pentoxide with hydrogen chloride gas.
- (b) Pyrolysis of methane.

(iii) Peter has passed gases A and B through freshly prepared lime water. Both the gases turned lime water milky. Gas B causes suffocation.

[3]

- (a) Identify the gases A and B.
- (b) Name the white insoluble ppt formed by reaction of gas B with lime water.
- (c) Name the soluble compound formed when excess of gas A is passed through lime water.

(iv) Ethyl alcohol is treated with excess of acidified $K_2Cr_2O_7$

[3]

- (a) What does $K_2Cr_2O_7$ provides in this reaction.
- (b) Name the product formed when ethanol is oxidised.
- (c) Write the formula of the product formed when product formed in Q.4.(iv).(b) is further oxidised.

Question 5

(i) Identify the reactant X and write the balanced chemical equation for the following

.[2]

- (a) Dilute nitric acid and X reacts to give calcium nitrate, water and sulphur dioxide gas
- (b) Dilute Hydrochloric acid and X reacts to give Sodium chloride and unstable Carbonic acid.

(ii) Oxidation of carbon monoxide is carried out to give carbon dioxide [2]
Find the volume of reactant gases required to produce 900 ml of CO_2 .
[C = 12, O = 16]

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

- (a) Reaction of glucose with conc. H_2SO_4
- (b) Reaction of potassium bicarbonate with conc. H_2SO_4
- (c) Reaction of sodium hydroxide with conc. H_2SO_4 to form two types of salts.

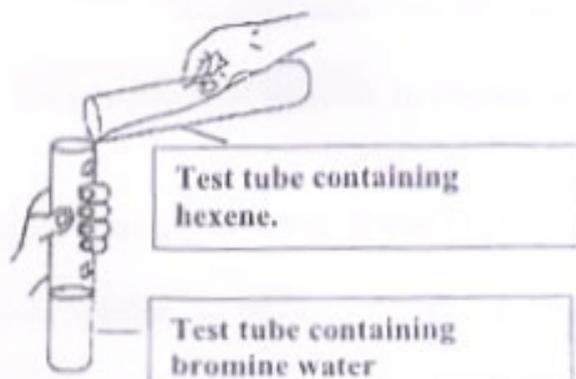
(iv) Give balanced equations, for the following: [3]

- (a) Decomposition of nitric acid.
- (b) Oxidation of ethene
- (c) Iodination of ethyne.

Question 6

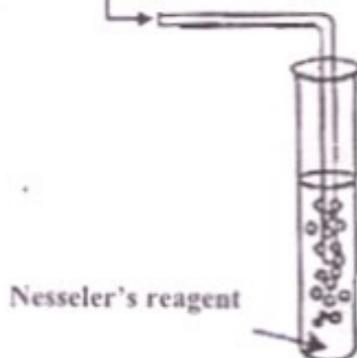
(i) Rajeev performed experiment 1 and experiment 2 as instructed. [2]
Observe the pictures given below and write one observation

Experiment 1



Experiment 2

Excess NH_3 gas is passed through a reagent solution



- (ii) You are provided with the list of chemicals mentioned below in the box: [2]

sodium hydroxide solution, zinc carbonate, dil. sulphuric acid, lead nitrate, sodium sulphate, zinc, dil. hydrochloric acid, dil. nitric acid

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

- (a) Zinc nitrate (b) Lead sulphate

- (iii) 374.5g of ammonium chloride reacts with calcium hydroxide at STP. [3]



[$\text{NH}_4\text{Cl} = 53.5$, $\text{Ca}(\text{OH})_2 = 74$, $\text{H}_2\text{O} = 18$]

- (a) Find the volume of ammonia formed.
(b) Calculate the weight of calcium hydroxide used.

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

- (a) Zinc blende + P \rightarrow zinc oxide + sulphur dioxide
(b) Lead oxide + Q \rightarrow Lead + Carbon dioxide



Question 7

- (i) Give reasons for the following: [2]
- (a) Aqua regia dissolves noble metals.
 - (b) Only D.C. current is used during electroplating.
- (ii) The following questions relate to the dressing of bauxite ore [2]
- (a) Why caustic alkali is added to bauxite.
 - (b) Write the balanced equation for conversion of sodium aluminate to aluminium hydroxide.
- (iii) Give balanced equations for each of the following: [3]
- (a) Action of conc. sulphuric acid on potassium nitrate. (temp. $< 200^\circ\text{C}$)
 - (b) Thermal decomposition of aluminium hydroxide.
 - (c) Hydrolysis of ethyl acetate.
- (iv) Shifa has 3 oxides U, T and S which are acidic oxide, basic oxide and neutral oxide respectively. Which oxide: [3]
- (a) can be used as laughing gas.
 - (b) will react with dil. H_2SO_4 to give corresponding metal sulphate salt.
 - (c) will decolourise KMnO_4 solution.

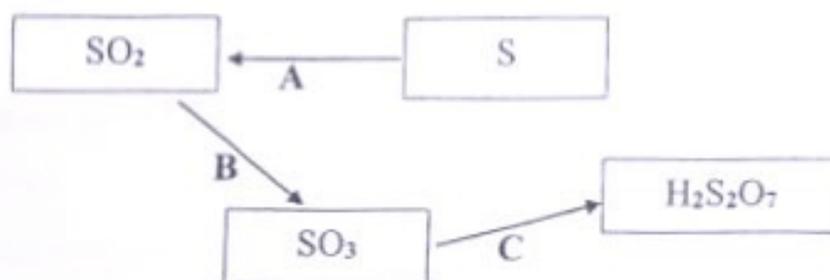
Question 8

- (i) Draw dot and cross diagram of hydronium ion. [2]
[H=1, O=8]
(show the formation)

(ii) State giving reasons if: [2]

- (a) Ferric nitrate and Ferrous nitrate can be distinguished using sodium hydroxide solution.
- (b) Sodium sulphide and Zinc sulphide can be distinguished using dilute sulphuric acid.

(iii) Write balanced chemical equation for the conversions (A to C) [3]



AL

Why the named metal is rendered passive by HNO_3 ?

Suggest a method to overcome the passivity of the metal.

(iv) L, M, N & O are first 4 elements belonging to group 14 of the periodic table. Answer the following questions using the alphabet given. Do not identify the elements. [3]

- (a) Metalloid with 4 electronic orbitals.
- (b) Element with least ionization potential.
- (c) Element with least electron affinity.

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