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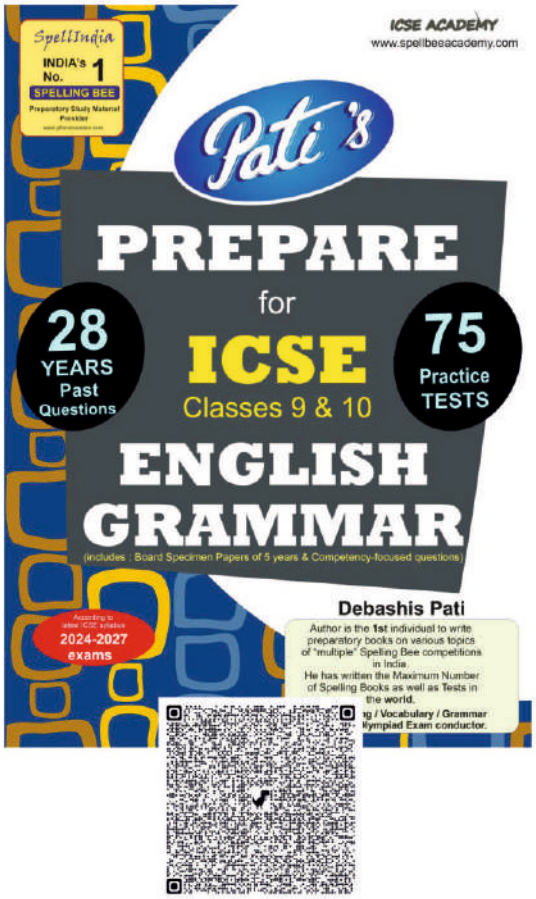

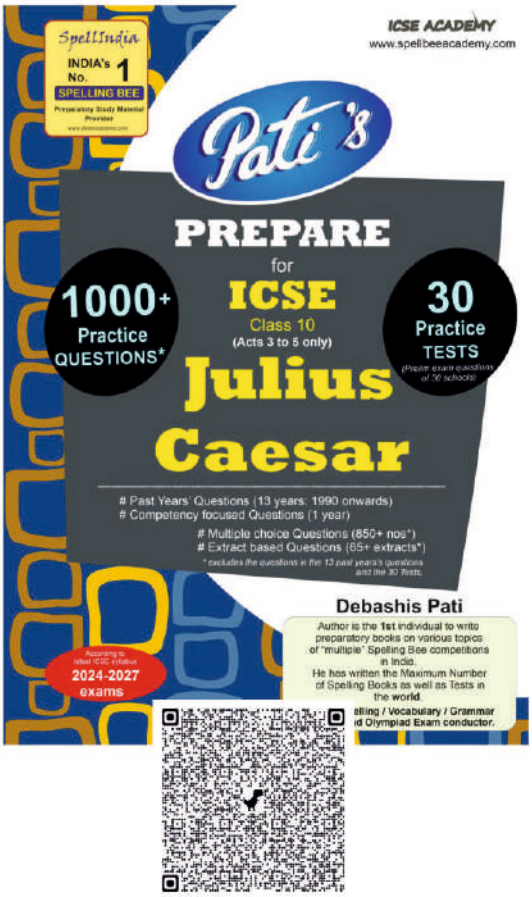

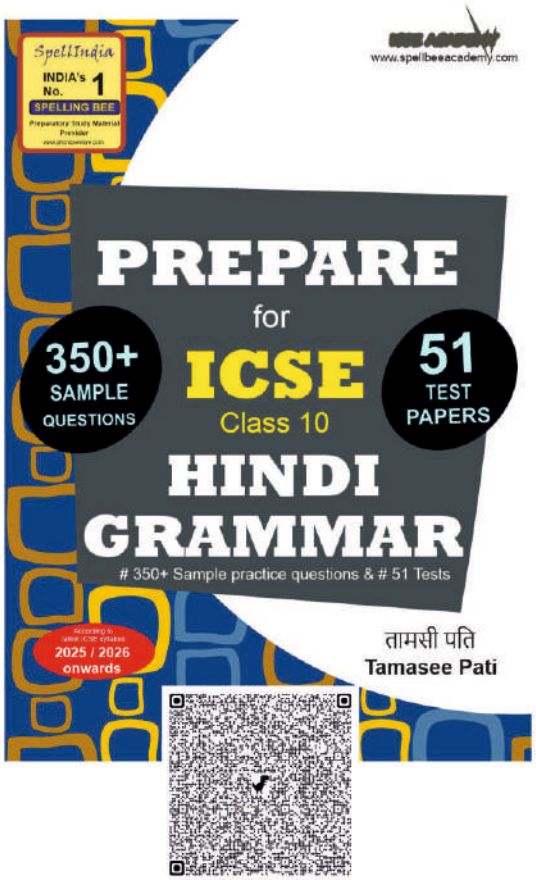

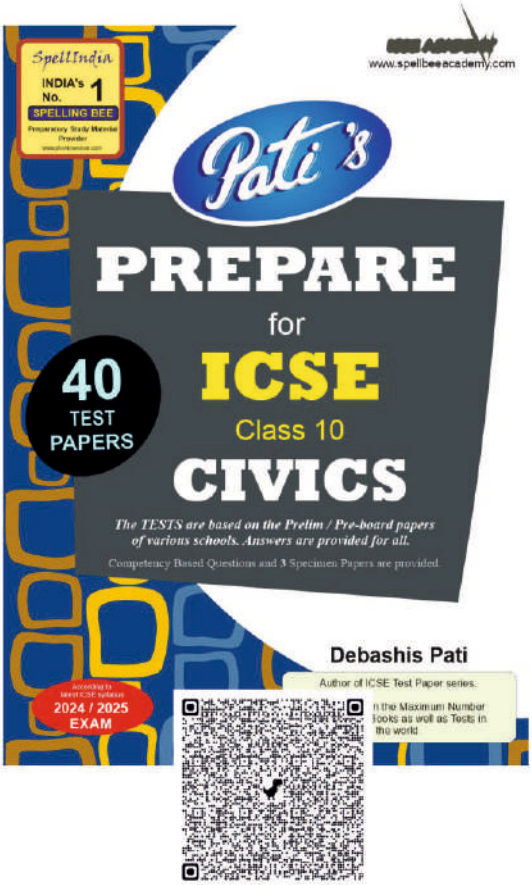

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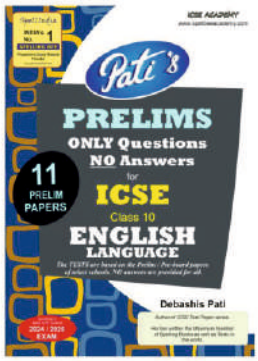

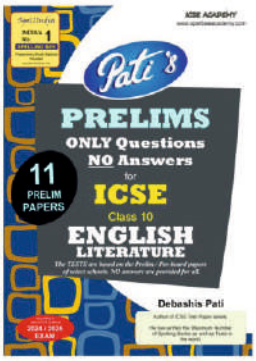

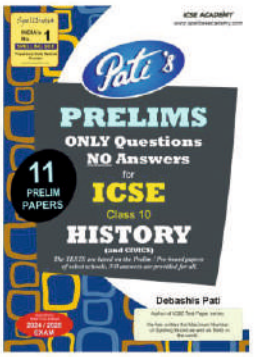

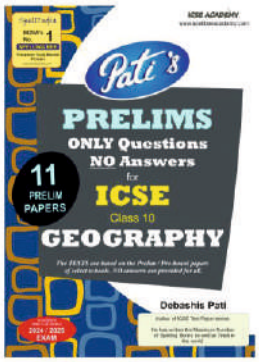

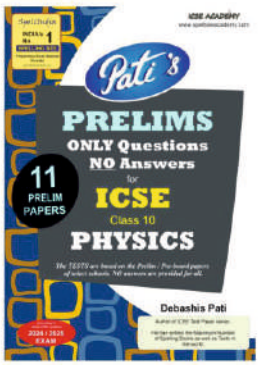

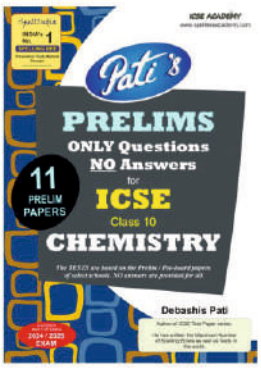

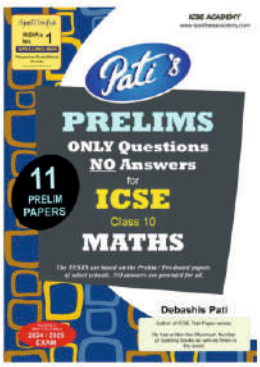

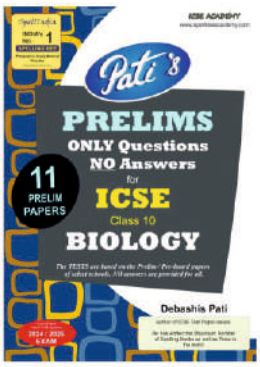

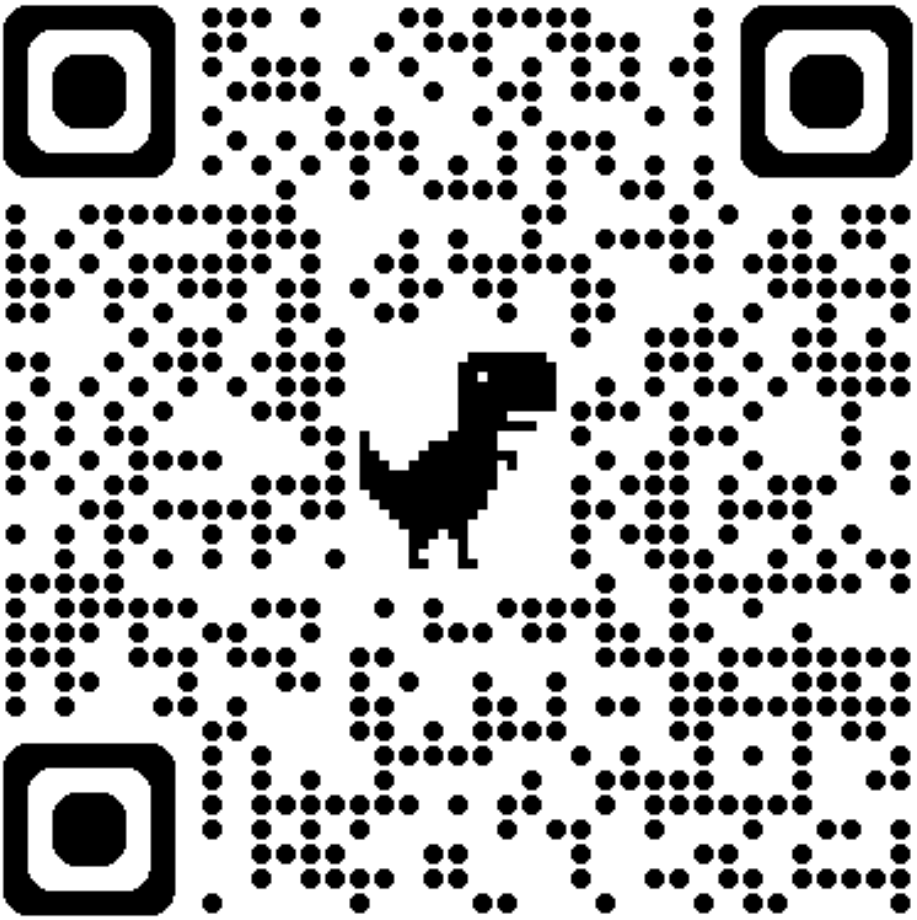

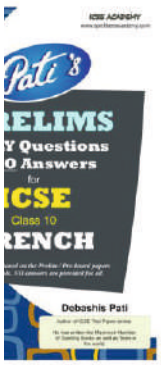

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ICSE 2026 EXAMINATION

SPECIMEN QUESTION PAPER

CHEMISTRY

(SCIENCE PAPER – 2)

Maximum Marks: 80

Time allowed: Two hours

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 [ ].*

Instruction for the Supervising Examiner

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

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) Which of the following will dissociate in aqueous solution, to give a positive ion other than hydronium ion and a negative ion other than hydroxyl ion?

(a) KOH

(b) dil. HCl

(c) NaCl

(d) CH_3COOH

[Understanding & Application]

(ii) A compound **P** is heated in a test tube with sodium hydroxide solution. A red litmus paper held at the mouth of the test tube turns blue.

Which of the following could compound **P** be?

(a) Zinc sulphate

(b) Copper sulphate

(c) Ferrous sulphate

(d) Ammonium sulphate

[Understanding]

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

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

(a) (A) is true and (R) is false.

(b) (A) is false and (R) is true.

(c) Both (A) and (R) are true and (R) is the correct explanation of (A).

(d) Both (A) and (R) are true, but (R) is not the correct explanation of (A).

[Understanding]

(iv) Identify the ion that contain one lone pair of electrons.

(a) OH^{-1}

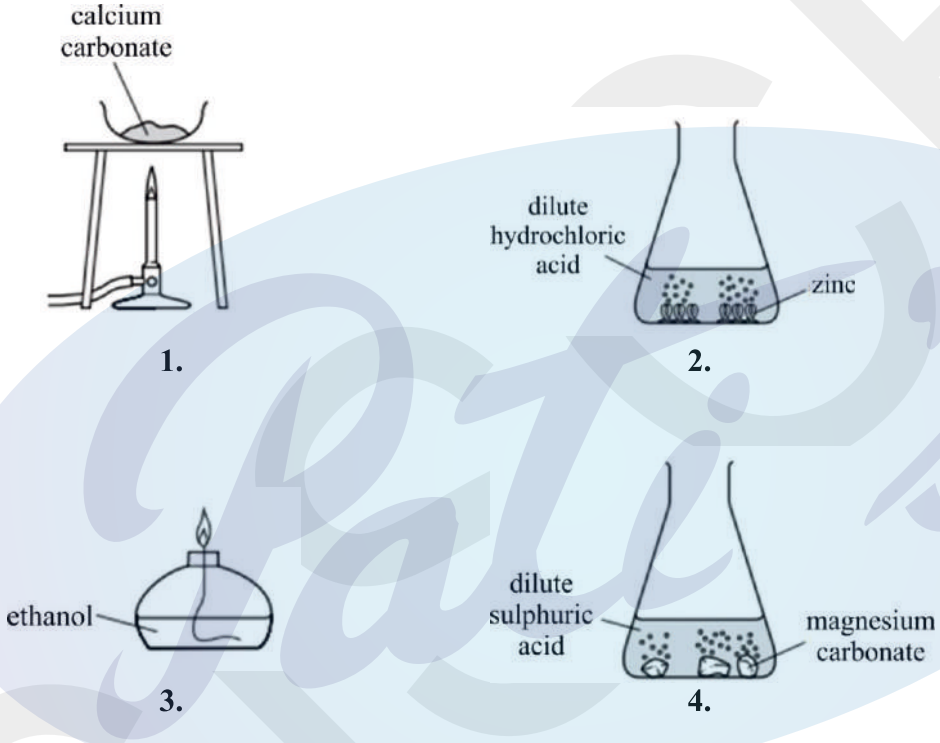
(b) H_3O^+

(c) NH_4^+

(d) H^+

[Understanding & Application]

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



Which reactions produce water?

(a) 1 and 2

(b) 1 and 3

(c) 3 and 4

(d) 2 and 3

[Understanding & Application]

(vi) When compound **X** reacts with dilute sulphuric acid, it releases a gas that turns acidified potassium dichromate solution from orange to green. Which of the following could be compound **X**?

(a) Lead nitrate

(b) Copper carbonate

(c) Sodium chloride

(d) Potassium sulphite

[Recall & Understanding]

(vii) The volume occupied by 2 moles of a gas at STP is:

(a) 22.4L

(b) 2.24L

(c) 44.8L

[Understanding]

(d) 4.48L

(viii) Identify from the following metal oxide which can react with an acid as well as an alkali.

(a) Silver oxide

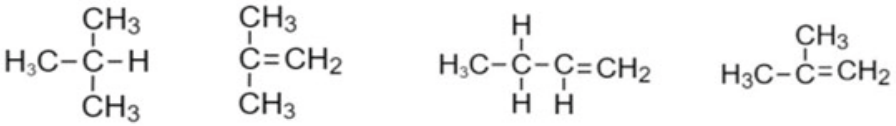
(b) Calcium oxide

(c) Copper(II) oxide

(d) Aluminium oxide

[Understanding]

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



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

(a) 1

(b) 2

(c) 3

(d) 4

[Analysis]

(x) Which element amongst the following has the largest atomic radius?

(a) Al

(b) S

(c) Mg

(d) Na

[Understanding & Application]

(xi) For which pH change is there the **maximum increase** in acidity?

	Initial pH	Final pH
(a)	1	3
(b)	2	6
(c)	3	1
(d)	6	2

[Understanding & Application]

(xii) The equation below shows the reaction between element 'X' and dilute sulphuric acid.

$$X(s) + H_2SO_4\ (aq.) \rightarrow XSO_4\ (aq.) + H_2\ (g)$$

Which particles are responsible for conducting electricity in dilute sulphuric acid and compound XSO_4?

(a) Electrons

(b) Only positive ions

(c) Only negative ions

(d) Both positive and negative ions

[Understanding]

(xiii) Methanol and ethanol belong to the same homologous series.

What does this statement mean?

(a) Their molecules contain atoms only of carbon and hydrogen.

(b) Their molecules have the same number of carbon atoms.

(c) They have the same functional group.

(d) They have the same relative molecular mass.

[Understanding]

(xiv) The ratio between the volumes occupied by 22 grams of carbon dioxide and 10 grams of hydrogen gas is:

(a) 2.2 :1

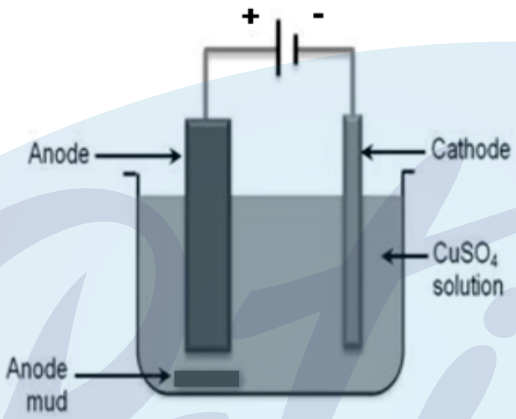
(b) 1: 2.2

(c) 1:10

(d) 10:1

[Application]

(xv) In the process of Electrorefining of Copper shown in the diagram below, which of the following statements is correct?



Electrorefining of Copper

(a) The anode is made of pure Copper.

(b) The cathode is made of impure Copper.

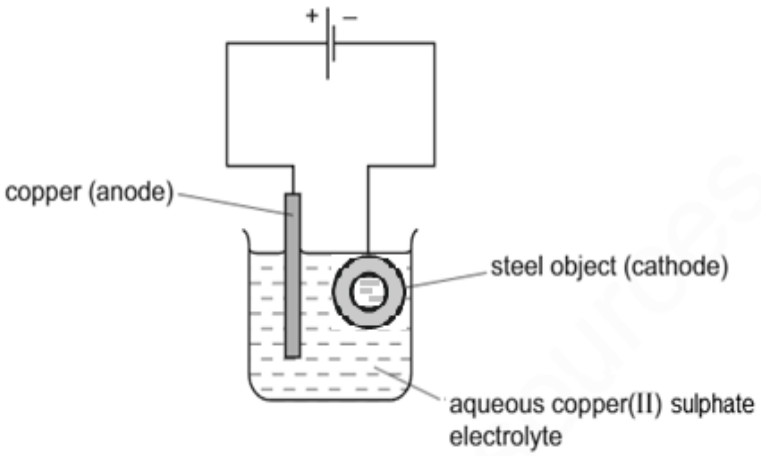
(c) Copper is deposited at the anode.

(d) Copper ions from the anode move to the cathode and get deposited as pure Copper.

[Understanding]

Question 2

(i) Electroplating steel objects with silver involves a three-step process. [5]



step 1 A coating of copper is applied to the object.

step 2 A coating of nickel is applied to the object.

step 3 The coating of silver is applied to the object.

(a) A diagram of the apparatus used for step 1 is shown.

1. The chemical process taking place on the surface of the object is $Cu^{2+}(aq) + 2e^- \rightarrow Cu(s)$
   What is the observation seen on the surface of the object?
2. Explain why the concentration of copper ions in the electrolyte remains constant throughout step1.

(b) Give **two** changes which would be needed in order to coat nickel onto the object in step 2.

(c) Write down the reaction taking place at the positive electrode during step 3.

[Understanding & Application]

(ii) Identify the following: [5]

(a) A bond formed between two atoms by sharing of 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) A reaction in which the hydrogen of an alkane is replaced by a halogen.

(d) The energy required to remove an electron from a neutral gaseous atom.

(e) A homogenous mixture of two or more metals or a metal and a non-metal in a definite proportion in their molten state.

[Recall]

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

(a) When dilute sulphuric acid reacts with zinc granules, the gas evolved is _____ *(hydrogen / carbon dioxide)*, which can be tested using a burning splint.

(b) A solution of copper(II) sulphate in sodium hydroxide solution forms a _____ *(pale blue / green)* precipitate.

(c) In methane, each hydrogen atom share(s) _____ *(one / two)* electron(s) with the central carbon atom to complete its valence shell.

(d) The electron affinity of element X is greater than that of element Y. The oxidising power of X is likely to be _____ *(more / less)* than that of element Y.

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

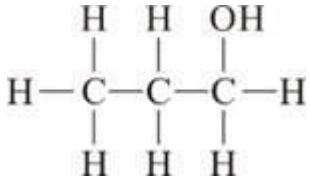
[Recall & Understanding]

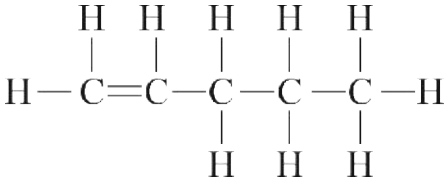
(iv) Match Column A with Column B. [5]

Column A	Column B
(a) Aluminium	1. Covalent compound
(b) Sulphuric acid	2. Carbonate ore
(c) Calcination	3. Hall Heroult's process
(d) Calcium Chloride	4. Contact Process
(e) Carbon tetrachloride	5. Electrovalent compound

[Recall & Understanding]

(v) (a) Give the IUPAC name of the following organic compounds: [5]

1. 

2. 

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

1. but-2-yne
2. 1, 1, 1, trichloro methane
3. pentan -2-ol

[Understanding]

SECTION B (40 Marks)

*(Attempt **any four** questions.)*

Question 3

(i) Give one significant observation when: [2]

(a) Excess of chlorine gas reacts with ammonia.

(b) Zinc nitrate is strongly heated in a test tube.

[Recall & Understanding]

(ii) Give reasons: [2]

(a) When ammonia gas is passed over black copper oxide in a combustion tube a reddish-brown substance is left behind.

(b) Quick lime is not used to dry hydrogen chloride gas. **[Understanding]**

(iii) The electron affinity of an element X is greater than that of element Y. [3]

(a) How is the oxidising power of X likely to compare with that of Y?

(b) How is the electronegativity of X likely to compare with that of Y?

(c) State whether X is likely to be placed to the left or to the right of Y in the periodic table?

[Application]

(iv) Write balanced chemical equations for the following reactions: [3]

(a) Ammonium chloride reacts with calcium hydroxide.

(b) Nitric acid reacts with zinc carbonate.

(c) Concentrated sulphuric acid is added to hydrated copper sulphate. **[Recall]**

Question 4

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

(a) Duralumin

(b) Brass **[Recall]**

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

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

(b) Bromine gas is passed over ethene in the presence of carbon tetrachloride. **[Recall & Understanding]**

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

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

(b) Which cation was present in the sample given to Abhishek?

(c) Identify the salt given to Abhishek for analysis. **[Understanding]**

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

(a) Name the type of reaction occurring in the above set up.

(b) What is the role of sulphuric acid in this reaction?

(c) State one observation that takes place during the reaction. **[Understanding]**

Question 5

(i) Identify the **reactant** and write the balanced **equation** for the following: [2]

Nitric acid reacts with compound **Q** to give a salt Calcium nitrate, water and carbon dioxide.

[Understanding]

(ii) What will be the mass of carbon dioxide that will contain the same number of molecules as present in 3.2g of oxygen gas? [2]

[At. Wt: O=16, C=12]

[Understanding & Application]

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

(a) Sulphur with concentrated sulphuric acid.

(b) Conversion of ferrous sulphide to hydrogen sulphide gas using sulphuric acid.

(c) Ethanol with concentrated sulphuric acid.

[Recall & Understanding]

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

(a) Laboratory preparation of ethyne from calcium carbide.

(b) Conversion of acetic acid to ethyl acetate.

(c) Laboratory preparation of nitric acid.

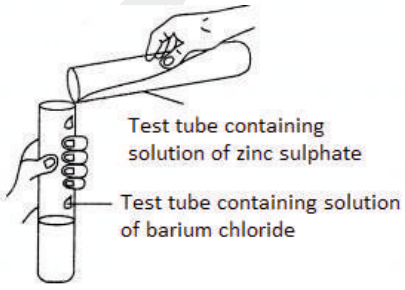
[Recall]

Question 6

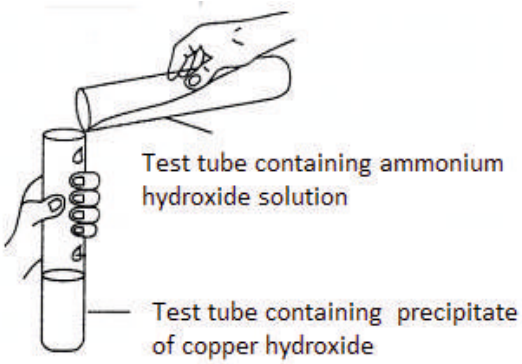
(i) A student was asked to perform two experiments in the laboratory based on the instructions given: [2]

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.

(a) Experiment 1



(b) Experiment 2



[Understanding]

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

Sodium hydroxide solution, copper carbonate, zinc, hydrochloric acid, copper, dilute sulphuric acid

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

(a) copper sulphate

(b) sodium zincate

[Understanding & Application]

(iii) Solid ammonium dichromate decomposes as under: [3]

$$(NH_4)_2Cr_2O_7 \rightarrow N_2 + Cr_2O_3 + 4H_2O$$

If 126 g of ammonium dichromate decomposes, calculate:

(a) the number of moles of ammonium dichromate that undergoes decomposition.

(b) the mass of chromic oxide formed at the same time.

(c) the volume of nitrogen gas evolved at STP.

[Understanding & Application]

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

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

(a) Copper oxide + P → Copper + water

(b) Iron pyrite + Q → Iron oxide + Sulphur dioxide

(c) Sodium chloride + R → Sodium nitrate + Silver chloride **[Application]**

Question 7

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

(a) Nitric acid does not normally liberate hydrogen gas when it reacts with active metals.

(b) Silver-plated cutlery is not considered as pure silver. **[Understanding]**

(ii) The following questions relate to the extraction of Aluminium by electrolysis. [2]

(a) Name the other compound which contains aluminium added to alumina.

(b) Give a balanced equation for the reaction that takes place at the cathode. **[Recall]**

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

(a) Action of warm water on aluminium nitride.

(b) Oxidation of carbon with conc. nitric acid.

(c) Laboratory preparation of ethanol by using chloroethane and aqueous sodium hydroxide. **[Recall & Understanding]**

(iv) Rohit has solution X, Y and Z that has pH 2, 7 and 13 respectively. [3]
Which solution:

(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? **[Application]**

Question 8

(i) State giving reasons if: [2]

(a) zinc metal and aluminium metal can be distinguished by heating the metal powders separately in two different test tubes with concentrated sodium hydroxide solution.

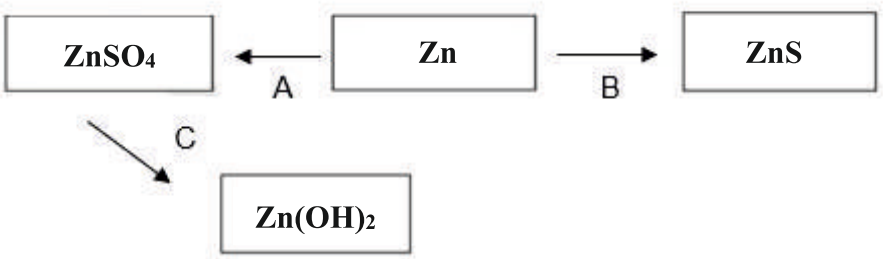
(b) calcium nitrate and lead nitrate can be distinguished by adding ammonium hydroxide solution to the salt solution. **[Understanding]**

(ii) Draw the electron dot diagram of ammonium ion. [2]

[Atomic No.: N = 7, H = 1]

[Recall & Understanding]

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



[Understanding & Application]

(iv) L, M and N are three elements with atomic numbers 13, 7 and 10 respectively. Answer the following questions using only the alphabets given. Do not identify the elements. [3]

Which element:

(a) can combine with hydrogen to form a gas which produces dense white fumes with concentrated HCl?

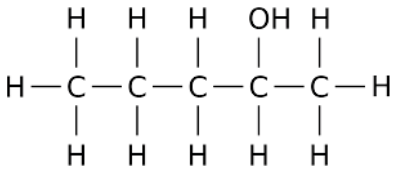
(b) has zero electron affinity?

(c) can form an ionic compound with oxygen? **[Understanding]**

ICSE 2026 SPECIMEN

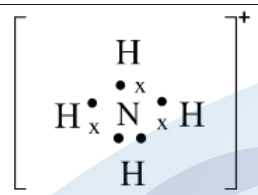
RAFT MAR IN SCHEME – CHEMISTRY (SCIENCE PAPER 2)

Question 1		[15x1]
(i)	(c) NaCl	
(ii)	(d) ammonium sulphate	
(iii)	(c) Both (A) and (R) are the true and (R) is the correct explanation of (A).	
(iv)	(b) H_3O^+	
(v)	(c) 3 and 4	
(vi)	(d) Potassium sulphite	
(vii)	(c) 44.8L	
(viii)	(d) Aluminium oxide	
(ix)	(b) 2	
(x)	(d) Na	
(xi)	(d) | 6 | 2	
(xii)	(d) Both positive and negative ions	
(xiii)	(c) They have the same functional group.	
(xiv)	(c) 1:10	
(xv)	(d) Copper ions from the anode move to the cathode and get deposited as pure Copper.	
Question 2		
(i)	(a) (1) reddish brown deposit/ pink deposit/ mass increases (2) As anode released Copper ions the concentration of copper ions does not decrease (b) Anode should be made up of Nickel and the electrolyte should be aq. Nickel sulphate or any salt solution of Nickel (c) $Ag \rightarrow Ag^+ + e^-$	[2+2+1]
(ii)	(a) Coordinate bond (b) Normal salt (c) Substitution	[5x1]

	(d) ionisation potential (e) alloy	
(iii)	(a) Hydrogen (b) pale blue (c) one (d) more (e) ore	[5x1]
(iv)	(a) 3 (b) 4 (c) 2 (d) 5 (e) 1	[5x1]
(v)	(a) 1. propanol 2. pentene (b) 1. but-2-yne  2. 1,1,1,trichloro methane  3. pentan -2-ol 	[3+2]
Question 3		
(i)	(a) Yellow oily explosive liquid (b) reddish-brown gas/ a gas which rekindles a glowing splinter/ a residue which is yellow when hot and white when cold is formed	[2]

(ii)	(a) Because copper oxide is reduced to copper (b) because quick lime reacts with hydrogen chloride gas	[2]
(iii)	(a) X has more oxidising power than Y (b) X will be more electronegative than Y (c) X will be placed to the right of Y	[3]
(iv)	(a) $2NH_4Cl + Ca(OH)_2 \rightarrow CaCl_2 + 2H_2O + 2NH_3$ (b) $2HNO_3 + ZnCO_3 \rightarrow Zn(NO_3)_2 + H_2O + CO_2$ (c) $H_2SO_4 + CuSO_4.5H_2O \rightarrow CuSO_4 + 5H_2O + H_2SO_4$	[3]
Question 4		
(i)	(a) Aluminium (b) Copper	[2]
(ii)	(a) $NaCl + \text{conc. } H_2SO_4 \rightarrow NaHSO_4 + HCl$ (b) $C_2H_4 + Br_2 \rightarrow C_2H_4Br_2$	[2]
(iii)	(a) Nitrogen dioxide (b) lead ion (c) Lead nitrate	[3]
(iv)	(a) Esterification (b) dehydrating agent (c) Fruity smell is obtained	[3]
Question 5		
(i)	Q is Calcium carbonate or Calcium bicarbonate $CaCO_3 + 2HNO_3 \rightarrow Ca(NO_3)_2 + H_2O + CO_2$ OR $Ca(HCO_3)_2 + 2HNO_3 \rightarrow Ca(NO_3)_2 + 2H_2O + 2CO_2$	[2]
(ii)	3.2 g of oxygen contains 6.023×10^{22} molecules so 4.4g of CO_2 will contain 6.023×10^{22} molecules Answer 4.4g of CO_2	[2]

(iii)	(a) Oxidizing property (b) Acidic property (c) dehydrating property	[3]
(iv)	(a) $CaC_2 + 2H_2O \rightarrow Ca(OH)_2 + C_2H_2$ (b) $CH_3COOH + C_2H_5OH \rightarrow CH_3COOC_2H_5 + H_2O$ (c) $NaNO_3 + \text{conc. } H_2SO_4 \rightarrow NaHSO_4 + 2HNO_3$	[3]
Question 6		
(i)	(a) White precipitate is formed. (b) blue precipitate dissolves to form an inky blue solution.	[2]
(ii)	(a) $CuCO_3 + H_2SO_4 \rightarrow CuSO_4 + H_2O + CO_2$ (b) $Zn + 2NaOH \rightarrow Na_2ZnO_2 + H_2$	[2]
(iii)	(a) 252 g of Ammonium dichromate = 1mole 126 g of Ammonium dichromate = 0.5 moles (b) 252 g of ammonium dichromate gives 152 g of chromic oxide 126 g of ammonium dichromate provides 152×126/ 252 = 76 g of chromic oxide (c) 252 g of ammonium dichromate produces 22.4 l of nitrogen 126 g of ammonium dichromate produces 22.4×126/ 252 = 11.2 l of nitrogen	[3]
(iv)	(a) Hydrogen (b) Oxygen (c) Silver Nitrate	[3]
Question 7		
(i)	(a) Nitric Acid is a very strong oxidising agent and hence oxidises hydrogen to water. So, it is not used for obtaining hydrogen from metals. (b) because it is not made fully of silver only its top coating is of silver	[2]
(ii)	(a) Cryolite (b) $Al^{3+} + 3e^- \rightarrow Al$	[2]

(iii)	(a) $AlN + 3H_2O \rightarrow Al(OH)_3 + NH_3$ (b) $C + 4HNO_3 \rightarrow CO_2 + 2H_2O + 4NO_2$ (c) C_2H_5Cl + aq. NaOH $\rightarrow$ $C_2H_5OH + NaCl$	[3]
(iv)	(a) X (b) Z (c) Y	[3]
Question 8		
(i)	(a) No, both will liberate hydrogen gas which burns with a pop sound (b) Yes, white ppt. will be formed with lead nitrate but no ppt. is formed with calcium nitrate/ or no visible reaction	[2]
(ii)		[2]
(iii)	A = $Zn + H_2SO_4 \rightarrow ZnSO_4 + H_2$ B = $Zn + S \rightarrow ZnS$ C = $ZnSO_4 + 2NaOH \rightarrow Zn(OH)_2 + Na_2SO_4$ or with NH_4OH	[3]
(iv)	(a) M (b) N (c) L	[3]

Pati's

ICSE ACADEMY

Specimen Papers

ICSE 2025 EXAMINATION

SPECIMEN QUESTION PAPER

CHEMISTRY

(SCIENCE PAPER – 2)

Maximum Marks: ***80***

Time allowed: ***Two 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 [ ].

Instruction for the Supervising Examiner

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

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) An aqueous solution of copper sulphate turns colourless on electrolysis.

Which of the following could be the electrodes?

P. anode: copper; cathode: copper

Q. anode: platinum; cathode: copper

R. anode: copper; cathode: platinum

(a) only P

(b) only Q

(c) only R

(d) both Q and R **[Understanding]**

(ii) A compound P is heated in a test tube with sodium hydroxide solution. A red litmus paper held at the mouth of the test tube turns blue.

Which of the following could compound P be?

(a) zinc sulphate

(b) copper sulphate

(c) ferrous sulphate

(d) ammonium sulphate **[Understanding]**

(iii) Which of the following would weigh the least?

(Atomic masses C=12, O=16, Na=23)

(a) 2 gram atoms of oxygen

(b) one mole of sodium

(c) 22.4 litres of carbon dioxide at STP

(d) 6.023×10^{22} atoms of carbon **[Applications]**

(iv) The equation below shows the reaction between element 'X' and dilute sulphuric acid.

$$X(s) + H_2SO_4\,(aq.) \rightarrow XSO_4\ (aq.) + H_2\,(g)$$

Which particles are responsible for conducting electricity in dilute sulphuric acid and compound XSO_4?

(a) Electrons

(b) Only positive ions

(c) Only negative ions

(d) Both positive and negative ions **[Understanding]**

(v) **Assertion (A):** Dry hydrogen chloride gas is collected by the upward displacement of air.

Reason (R): Hydrogen chloride gas is lighter than air.

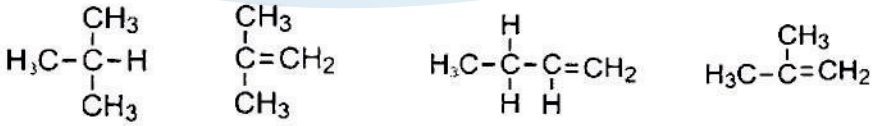
(a) Both A and R are true and R is the correct explanation of A

(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 **[Understanding]**

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



How many isomers of butene are there?

(a) 1

(b) 2

(c) 3

(d) 4 **[Analysis]**

(vii) Element 'P' has electronic configuration 2,8,8,1. The number of chlorine atoms present in the chloride of 'P' is:

(a) 2

(b) 1

(c) 3

(d) 4

[Understanding & Application]

(viii) $_1H^2$ is an isotope of hydrogen. In the modern Periodic Table it will:

(a) be placed before hydrogen

(b) be placed after hydrogen

(c) be placed at the same position as hydrogen

(d) not have any position in the Periodic Table **[Understanding]**

(ix) A nitrate which forms a precipitate with ammonium hydroxide and is also soluble in excess of it:

(a) ferrous nitrate

(b) ferric nitrate

(c) lead nitrate

(d) copper nitrate **[Understanding]**

(x) Which of the following electronic configuration represents the most electropositive element?

(a) 2, 1

(b) 2, 8, 1

(c) 2, 2

(d) 2, 8, 2 **[Understanding]**

(xi) **Assertion (A):** Alkali metals do not form dipositive ions.

Reason (R): After loss of one electron alkali metals achieve 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 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 **[Understanding]**

(xii) The ratio between the volumes occupied by 4.4 grams of carbon dioxide and 2 grams of hydrogen gas is:

(a) 2.2 :1

(b) 1: 2.2

(c) 1:10

(d) 10:1 **[Application]**

(xiii) Aqueous lead (II) nitrate can be distinguished from aqueous zinc nitrate by adding any of the following solution in excess, except:

(a) aqueous potassium chloride

(b) aqueous sodium sulphate

(c) dilute sulphuric acid

(d) sodium hydroxide solution **[Understanding]**

(xiv) Which of the following about oxides is correct?

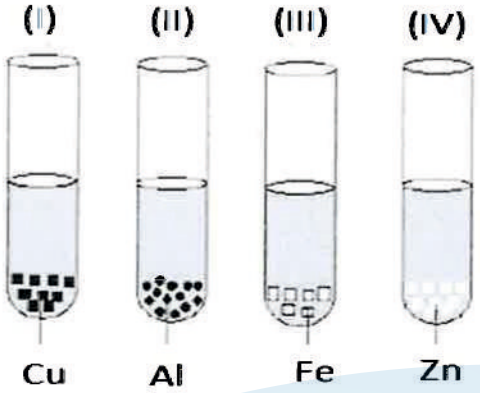
(a) A basic oxide is an oxide of a non-metal

(b) Acidic oxides contain ionic bonds

(c) Amphoteric oxides contain a metal

(d) Basic oxides are always gases **[Understanding]**

(xv) A student takes Cu, Al, Fe and Zn strips, separately in four test tubes labeled as I, II, III and IV respectively. He adds 10 ml of freshly prepared ferrous sulphate solution to each test tube and observes the colour of the metal residue in each case.



He would observe a black residue in the test tubes:

(a) (I) and (II)

(b) (I) and (III)

(c) (II) and (III)

(d) (II) and (IV)

[Understanding & Application]

Pati's

ICSE ACADEMY

Specimen Papers

ICSE 2024 EXAMINATION

SPECIMEN QUESTION PAPER

CHEMISTRY

(SCIENCE PAPER – 2)

Maximum Marks: 80

Time allowed: Two 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

*(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) An aqueous solution of copper sulphate turns colourless on electrolysis.

Which of the following could be the electrodes?

P. anode: copper; cathode: copper

Q. anode: platinum; cathode: copper

R. anode: copper; cathode: platinum

(a) only P

(b) only Q

(c) only R

(d) both Q and R

(iii)

(ii) A compound P is heated in a test tube with sodium hydroxide solution. A red litmus paper held at the mouth of the test tube turns blue.

Which of the following could compound P be?

(a) zinc sulphate

(b) copper sulphate

(c) ferrous sulphate

(d) ammonium sulphate

(iii) The atomic masses of sulphur (S), oxygen (O), and helium (He) are approximately 32, 16, and 4 respectively.

Which of the following statements regarding the number of atoms in 32 g of sulphur, 16 g of oxygen, and 4 g of helium is correct?

P. 16 g of oxygen contains four times the number of atoms as 4 g of helium.

Q. 16 g of oxygen contains half the number of atoms as 32 g of sulphur.

(a) only P

(b) only Q

(c) both P and Q

(d) neither P nor Q

(iv) Ammonia gas is passed through quicklime and then collected in a jar. Red and blue litmus papers are placed in the jar. W, X, Y and Z are the four observations.

Which of the above observations correctly shows the reaction of the litmus papers to ammonia?

	Red litmus paper	**Blue litmus paper**
W	turns blue	remains blue
X	remains red	remains blue
Y	remains red	turns red
Z	turns blue	turns red

(a) W

(b) X

(c) Y

(d) Z

(iii)

(v) Glucose reacts with concentrated sulphuric acid to give a very pure form of carbon called sugar charcoal.

The reaction taking place is:

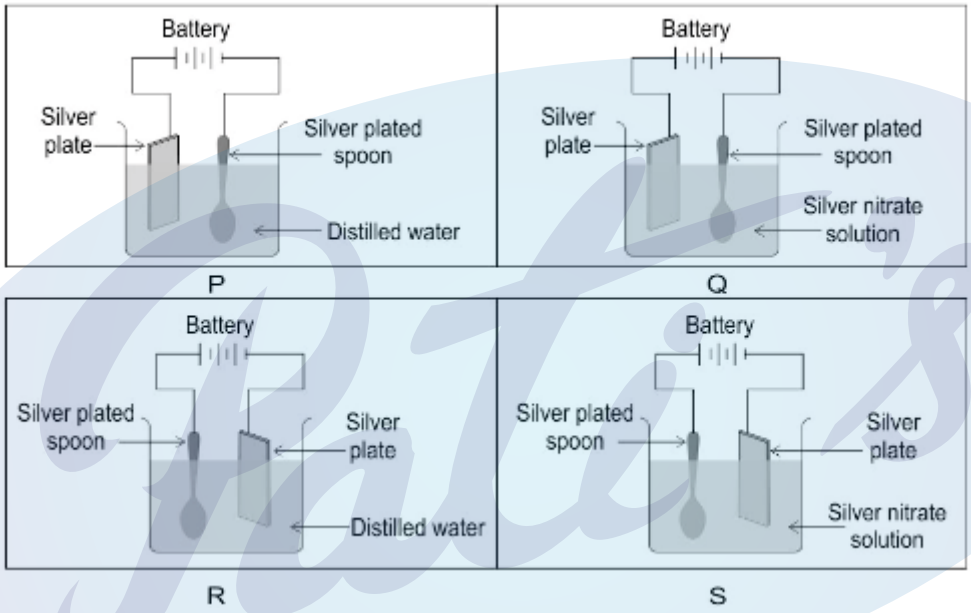
(a) oxidation

(b) combustion

(c) dehydration

(d) combination

(vi) In which of the following electrolytic cells [P, Q, R or S] will silver plating be done on the spoon?



(a) P

(b) Q

(c) R

(d) S

(vii) The basicity of acetic acid is:

(a) 1

(b) 2

(c) 3

(d) 4

(iii)

(viii) $A \rightarrow A^{+3}$; $B \rightarrow B^{-1}$

Number of electrons present in the outermost shell of atoms A and B respectively are:

(a) 5, 1

(b) 3, 1

(c) 3, 7

(d) 5, 7

(ix) A _____ solution is observed after placing Magnesium metal in a solution of Copper sulphate for half an hour.

(a) Blue

(b) Colourless

(c) Reddish brown

(d) Dirty green

(x) An element with atomic no. _____ will form an acidic oxide.

(a) 3

(b) 17

(c) 11

(d) 13

(xi) Which of the following is NOT true with respect to nitric acid?

(a) It is a strong reducing agent

(b) It is a strong oxidizing agent

(c) It is unstable to heat

(d) It liberates sulphur dioxide gas when treated with potassium sulphite

(xii) _____ is the functional group in methanol.

(a) >C=O

(b) –OH

(c) –CHO

(d) –COOH

(iii)

(xiii) The process of electrolysis is an example of:

(a) Oxidation reaction

(b) Reduction reaction

(c) Redox reaction

(d) Displacement reaction

(xiv) The catalyst used in Ostwald's process is _____.

(a) Finely divided iron

(b) Graphite

(c) Vanadium pentoxide

(d) Platinum

(xv) An element belongs to third period and sixteenth group. It will have _____ electrons in its valence shell.

(a) 2

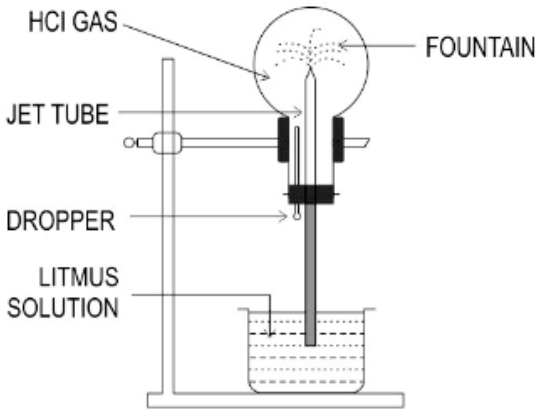
(b) 5

(c) 6

(d) 3

Question 2

(i) The setup shown below is that of the fountain experiment with hydrogen chloride gas in the flask. [5]



The fountain starts when a few drops of water from the dropper are introduced into the flask. Instead of the drops of water, Pooja started the fountain by introducing a few drops of Sodium hydroxide into the flask.

(a) Explain why the litmus solution gets sucked up when Sodium hydroxide is used.

(b) What will be the colour of the fountain when Sodium hydroxide is used? Justify your answer.

(c) If instead of HCl gas, ammonia gas is filled in the flask and water is introduced from the dropper, will there be a different observation? Justify your answer.

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

Column A		Column B	
(a)	Aluminium	1.	Covalent compound
(b)	Sulphuric acid	2.	Carbonate ore
(c)	Calcination	3.	Hall Heroult's process
(d)	Calcium Chloride	4.	Contact Process
(e)	Carbon tetrachloride	5.	Electrovalent compound

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

(a) If an element has one electron in the outermost shell then it is likely to have the _____ [smallest/ largest] atomic size amongst all the elements in the same period.

(b) _____ [sulphuric acid/ hydrochloric acid] does not form an acid salt.

(c) A _____ [reddish brown/ dirty green] coloured precipitate is formed when ammonium hydroxide is added to a solution of ferric chloride.

(d) Alkanes undergo _____ [addition/ substitution] reactions.

(e) An _____ [alkaline/acidic] solution will turn methyl orange solution pink.

(iv) Identify the following: [5]

(a) A bond formed between two atoms by sharing of a pair of electrons, with both electrons being provided by the same atom.

(b) A salt formed by the complete neutralization of an acid by a base.

(c) A reaction in which the hydrogen of an alkane is replaced by a halogen.

(d) The energy required to remove an electron from a neutral gaseous atom.

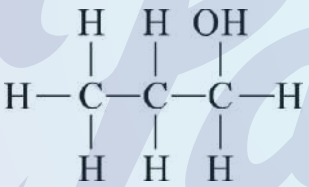
(e) A homogenous mixture of two or more metals or a metal and a non-metal in a definite proportion in their molten state.

(v) (a) Draw the structural diagram for the following compounds: [5]

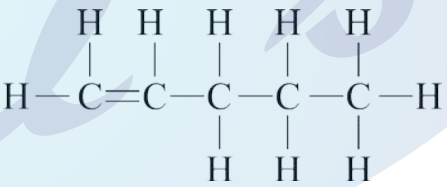
1. 1- propanal
2. 1, 2 dichloro ethane
3. But-2-ene

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

1.



2.



SECTION B

*(Attempt **any four** questions.)*

Question 3

(i) Identify the reactant and write the balanced equation for the following: [2]
Nitric acid reacts with compound Q to give a salt $Ca(NO_3)_2$, water and carbon dioxide.

(ii) What property of Sulphuric acid is exhibited in each of the following cases: [2]

(a) In the preparation of HCl gas when it reacts with Sodium chloride.

(b) When conc. Sulphuric acid reacts with Copper to produce Sulphur dioxide gas.

(iii) The electron affinity of an element X is greater than that of element Y. [3]

(a) How is the oxidising power of X likely to compare with that of Y?

(b) How is the electronegativity of X likely to compare with that of Y?

(c) State whether X is likely to be placed to the left or to the right of Y in the periodic table?

(iv) (a) State wether the following statements are TRUE or FALSE. Justify your answer. [3]

1. In an electrovalent compound, the cation attains the electronic configuration of the noble gas that comes after it in the periodic table.
2. In the formation of a compound PQ_2, atom P gives one electron to each atom of Q. The compound PQ_2 is a good conductor of electricity.

(b) Calculate the number of moles in 22 grams of carbon dioxide .

Question 4

(i) The following questions relate to the extraction of Aluminium by electrolysis. [2]

(a) Name the other aluminum containing compound added to alumina.

(b) Give a balanced equation for the reaction that takes place at the cathode.

(ii) A gas cylinder of capacity 40 dm^3 is filled with gas X the mass of which is 20 g. When the same cylinder is filled with hydrogen gas at the same temperature and pressure the mass of hydrogen is 2 g. Find the relative molecular mass of the gas. [2]

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

(a) Action of warm water on Aluminium nitride.

(b) Oxidation of carbon with conc. Nitric acid.

(c) Dehydration of ethanol by conc. Sulphuric acid at a temperature of 170°C.

(iv) With respect to Haber's process answer the following: [3]

(a) Temperature of the reaction

(b) Catalyst used

(c) Balanced equation for the reaction occurring

Question 5

(i) (a) Ranjana wants to prove that ammonia is a reducing agent. To demonstrate this, she passes ammonia gas over heated copper oxide. What will she observe? [2]

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

(ii) Name the alloy which is made up of: [2]

(a) Copper, Zinc and Tin

(b) Lead and Tin

(iii) Seema takes a blue crystalline salt P in a test tube. On heating it produces a white anhydrous powder. P is dissolved in water. Zinc is added to one part of the solution and to another part of the solution Barium chloride is added. [3]

(a) Name the compound P.

(b) Mention one observation when zinc is added to the solution of P.

(c) State the colour of the precipitate formed when barium chloride is added to the solution of P.

(iv) Give reasons: [3]

(a) Ethene undergoes addition reaction.

(b) Hydrocarbons can be used as fuels.

(c) Hydrogen chloride gas cannot be collected over water.

Question 6

(i) Name the following: [2]

(a) The ore of Zinc containing its sulphide .

(b) The most commonly used oxide ore of Aluminium.

(ii) State one observation in the following cases: [2]

(a) Sodium chloride solution is added to a solution of lead nitrate.

(b) Barium chloride solution is added to a solution of Zinc sulphate.

(iii) Copper sulphate solution is electrolysed using copper electrodes. [3]

(a) Which electrode [cathode or anode] is the oxidizing electrode? Why?

(b) Write the equation for the reaction occurring at the above electrode.

(iv) X [2, 8, 7] and Y [2, 8, 2] are two elements. Using this information complete the following: [3]

(a) _____ is the metallic element.

(b) Metal atoms tend to have a maximum of _____ electrons in the outermost shell.

(c) _____ is the reducing agent.

Question 7

(i) The empirical formula of an organic compound is C_3H_4N. Its molecular weight is 108. Find the amount of carbon in one mole of the compound. Show all the steps involved. (Atomic weights: C- 12; H- 1; N- 14) [3]

(ii) (a) Mahesh prepared a basic solution X that has a pH 7. [3]
How will the pH of the solution X change on addition of the following:

1. Hydrochloric acid
2. a solution of a base

(b) The atomic number of an element is 15. To which group will this element belong to?

(iii) 8.2 grams of calcium nitrate is decomposed by heating according to the equation [4]

$2Ca(NO_3)_2$ _____ → $2CaO + 4NO_2 + O_2$

Calculate the following:

(a) Volume of nitrogen dioxide obtained at STP

(b) Mass of CaO formed

[Atomic weights: Ca –40 , N—14, O—16]

Question 8

(i) State giving reasons if: [2]

(a) zinc and aluminium can be distinguished by heating the metal powder with concentrated sodium hydroxide solution.

(b) calcium nitrate and lead nitrate can be distinguished by adding ammonium hydroxide solution to the salt solution.

(ii) Draw the electron dot diagram of Hydronium ion. [2]

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

(a) Laboratory preparation of ethyne from calcium carbide.

(b) Conversion of acetic acid to ethyl acetate.

(c) Laboratory preparation of nitric acid.

(iv) Identify the following substances: [3]

(a) An alkaline gas which produces dense white fumes when reacted with HCl gas.

(b) The anion present in the salt, which produces a gas with the smell of rotten eggs when reacted with dil. HCl.

(c) The particles present in strong electrolytes.

Pati's

ICSE ACADEMY

Specimen Papers

(iii)

(xiii) The process of

ICSE 2023 EXAMINATION

SPECIMEN QUESTION PAPER

CHEMISTRY

(SCIENCE PAPER – 2)

Maximum Marks: 80

Time allowed: Two hours

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

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

SECTION A

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

Question 1

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

(i) A weak electrolyte is:

(a) Alcohol

(b) Potassium hydroxide

(c) Ammonium hydroxide

(d) Glucose

(ii) Electron affinity is maximum in:

(a) Alkaline earth metals

(b) Halogens

(c) Inert gases

(d) Alkali metals

(iii) The main components of bronze are:

(a) Copper and tin

(b) Copper and iron

(c) Copper and lead

(d) Copper and zinc

(iv) A polar covalent compound is:

(a) Methane

(b) Ammonia

(c) Nitrogen

(d) Chlorine

(v) An acid which has two replaceable hydrogen ions:

(a) Acetic acid

(b) Hydrochloric acid

(c) Phosphoric acid

(d) Carbonic acid

(vi) The hydroxide which is soluble in excess of NaOH is:

(a) Ferric hydroxide

(b) Lead hydroxide

(c) Copper hydroxide

(d) Calcium hydroxide

(vii) If the RMM of carbon dioxide is 44, then its vapour density is:

(a) 22

(b) 32

(c) 44

(d) 88

(viii) Drying agent used to dry Hydrogen chloride gas:

(a) Concentrated Sulphuric acid

(b) Calcium oxide

(c) Sulphurous acid

(d) Calcium hydroxide

(ix) The catalyst used in the Haber's Process is:

(a) Molybdenum

(b) Platinum

(c) Nickel

(d) Finely divided Iron

(x) An aqueous compound which turns colourless phenolphthalein to pink:

(a) Ammonium hydroxide

(b) Nitric acid

(c) Anhydrous calcium chloride

(d) Sulphuric acid

(xi) The gas formed when carbon reacts with concentrated sulphuric acid:

(a) Hydrogen

(b) Sulphur trioxide

(c) Sulphur dioxide

(d) Oxygen

(xii) The organic compound prepared when Ethanol undergoes dehydration:

(a) Methane

(b) Ethane

(c) Acetylene

(d) Ethene

(xiii) The IUPAC name of methyl acetylene is:

(a) Propyne

(b) Ethene

(c) Propane

(d) Ethyne

(xiv) The product formed at the cathode in electroplating of an article with Nickel is:

(a) Hydrogen gas

(b) Nickel ions

(c) Nickel atoms

(d) Oxygen gas

(xv) An alkali metal found in period 3 and group 1 is:

(a) Magnesium

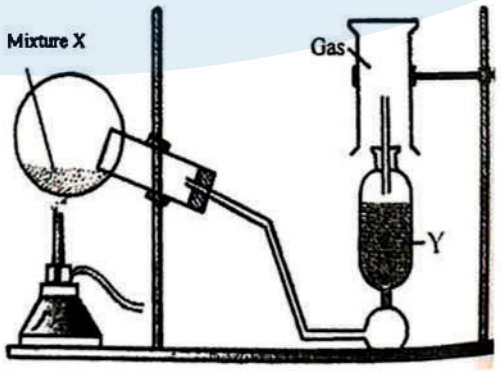
(b) Lithium

(c) Sodium

(d) Potassium

Question 2

(i) The diagram shows an experiment set up for the laboratory preparation of a pungent smelling gas. The gas is alkaline in nature. [5]



(a) Name the gas collected in the gas jar.

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

(c) How is the gas being collected?

(d) What is the purpose of using Y?

(e) How will you find that the jar is full of gas?

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

Column A		Column B	
(a)	Acid Salt	1.	Black in colour
(b)	Copper Oxide	2.	Reddish brown
(c)	Zinc hydroxide	3.	Hydrogen chloride
(d)	Copper Metal	4.	Sodium Hydrogen Carbonate
(e)	Polar compound	5.	Soluble in excess sodium hydroxide

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

(a) Ammonia in the liquefied form is _____. [neutral / basic]

(b) Organic compounds are generally insoluble in _____. [Water / Organic solvents]

(c) An inert electrode used in electrolysis of acidified water is _____. [iron / platinum]

(d) Hydrocarbons having double bond is _____. [alkenes / alkynes]

(e) An alkaline gas gives dense white fumes of _____ [NH_4OH / NH_4Cl] with hydrogen chloride gas.

(iv) Identify the following: [5]

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

(b) A substance that conducts electricity in molten or aqueous state.

(c) The energy required to remove an electron from the valence shell of a neutral isolated gaseous atom.

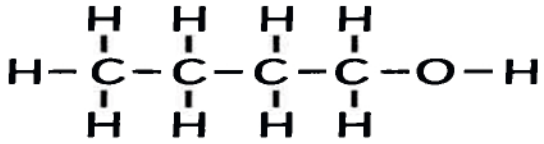
(d) The name of the process by which the Bauxite ore is concentrated.

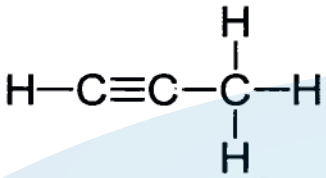
(e) The bond formed by a shared pair of electrons with both electrons coming from the same atom.

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

1. 2-pentanol
2. Ethanal
3. 1-butene

(b) Name the following organic compounds in IUPAC system:

1. 

2. 

SECTION B

*(Attempt **any four** questions.)*

Question 3

(i) Identify the Anion present in each of the following compounds. [2]

(a) When Barium Chloride Solution is added to a solution of compound B, a white precipitate insoluble in dilute Hydrochloric acid is formed.

(b) When dilute Sulphuric acid is added to compound D, a gas is produced which turns lime water milky but has no effect on acidified potassium dichromate solution.

(ii) Write the products and balance the equation. [2]

(a) S+ Conc HNO_3 →

(b) ZnS + HCl →

(iii) Arrange the following as per the instruction given in the brackets: [3]

(a) Na, K, Cl, Si, S. (increasing order of electro negativity)

(b) Be, Li, F, C, B, N, O (increasing order of metallic character)

(c) Br, F, I, Cl (increasing order of atomic size)

(iv) Fill in the blanks selecting the appropriate word from the given choice: [3]

(a) In a covalent compound the bond is formed due to _____ of electrons (sharing / transfer)

(b) A molecule which has a single lone pair of electrons _____. (NH_3 / H_2O)

(c) Electrovalent compounds do not conduct electricity in their _____ state. (molten / solid)

Question 4

(i) For each of the substances given below, what is the role played in the extraction of Aluminum. [2]

(a) Cryolite

(b) Graphite

(ii) Calculate: [2]

(a) A gas cylinder is filled with hydrogen and it holds 5 gms of gas. The same cylinder holds 85 gms of gas X under same temperature and pressure. Calculate the vapour density of gas X.

(b) Give the empirical formula of CH_3COOH.

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

(a) Write a balanced chemical equation for its preparation mentioning the condition required.

(b) Why is concentrated Nitric Acid not used in the preparation of Hydrogen Chloride gas?

(c) How is Hydrogen Chloride gas collected?

(iv) Explain the following: [3]

(a) Concentrated Nitric acid appears yellow when it is left standing in a glass bottle.

(b) An inverted Funnel is used to dissolve Hydrogen Chloride gas in water.

(c) All apparatus made of glass is used in the laboratory preparation of Nitric acid.

Question 5

(i) (a) State one property of Ammonia demonstrated in the Fountain Experiment. [2]

(b) Give the ionic equation when Ammonium Hydroxide is dissolved in water.

(ii) Name a probable Cation present based on the following Observations: [2]

(a) Reddish brown precipitate insoluble in Ammonium Hydroxide.

(b) Blue coloured sulphate solution.

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

(a) Laboratory Preparation of Methane from Sodium Acetate.

(b) Preparation of Ethyne from 1, 2 dibromoethane.

(c) Ethene reacting with Chlorine.

(iv) State one relevant observation for each of the following reactions: [3]

(a) When excess Ammonia is passed through an aqueous solution of Lead Nitrate.

(b) Copper Sulphate solution is electrolysed using Copper electrodes.

(c) Ammonium hydroxide is added to Ferrous Sulphate solution.

Question 6

(i) Define: [2]

(a) Gay Lussac's law of combining volume.

(b) Vapour Density

(ii) Solve: [2]

1250cc of oxygen was burnt with 300cc of ethane (C_2H_6). Calculate the volume of the unused oxygen.and the volume of the carbon dioxide formed.

$2C_2H_6 + 7O_2 \rightarrow 4CO_2 + 6H_2O$

(iii) State the conditions required for the following reactions: [3]

(a) Conversion of Sulphur dioxide to Sulphur trioxide.

(b) Conversion of Ammonia to Nitric acid

(c) Conversion of Nitrogen to Ammonia

(iv) Choose the role played by concentrated Sulphuric acid as A, B, C which is responsible for the reactions 1 to 3. [3]

A. Oxidizing agent

B. Non Volatile Acid

C. Dehydrating agent

1. $NaNO_3 + H_2SO_4 \xrightarrow{<200^\circ C} NaHSO_4 + HNO_3$

2. $CuSO_4.5H_2O \xrightarrow{H_2SO_4} CuSO_4 + 5H_2O$

3. $S + 2H_2SO_4 \longrightarrow 3SO_2 + 2H_2O.$

Question 7

(i) Find the empirical formula and molecular formula of an organic compound from the data given below: [2]

C = 75.92% H = 6.32%, N = 17.76% its vapour density is 39.5

(At.wt: C=12, H=1, N=14)

(ii) Identify the functional group in the following organic compounds: [2]

(a) HCHO

(b) C_2H_5COOH

(iii) During the Electrolysis of Copper II Sulphate solution using platinum as cathode and graphite as anode. [3]

(a) State what you observe at the cathode.

(b) State the change noticed in the electrolyte.

(c) Write the reaction at the cathode.

(iv) Choose the answer from the list which fits the description. [3]

[CaO, CO_2, NaOH, $Fe(OH)_3$, CO]

(a) A basic oxide.

(b) An oxide which is acidic.

(c) An Alkali.

Question 8

(i) Draw the electron dot structure for the following. [2]

(a) H_3O^+

(b) CH_4

(ii) Distinguish between the following as directed: [2]

(a) Sodium Carbonate and Sodium Sulphate by using dilute HCl

(b) Ammonium Sulphate and Sodium Sulphate by using Calcium hydroxide.

(iii) Name the particles present in: [3]

(a) Strong Electrolyte

(b) Weak Electrolyte

(c) Non Electrolyte

(iv) An element X has atomic number 17. Answer the following questions. [3]

(a) State the period & group to which it belongs:

(b) Is it a Metal or Non Metal?

(c) Write the formula between X and Hydrogen.

Pati's

ICSE ACADEMY

Specimen Papers

- 2022

Semester 2

ICSE SEMESTER 2 EXAMINATION

SPECIMEN QUESTION PAPER

CHEMISTRY

(SCIENCE PAPER 2)

Maximum Marks: 40

Time allowed: One and a half hours

Answers 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.

*Attempt **all** questions from **Section A** and **any three** 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.) [10]

(i) The IUPAC name of Ethylene is:

(a) Propane

(b) Propyne

(c) Ethene

(d) Ethyne

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

(a) 2-butylene

(b) Acetaldehyde

(c) Acetic acid

(d) Ethyl alcohol

(iii) Fused alumina is reduced to aluminium by electrolytic reduction, since:

(a) Alumina is highly stable

(b) Alumina is least stable

(c) Alumina is not reduced by drying agents.

(d) Alumina is not reduced by reducing agents.

(iv) The catalyst preferred in the conversion of Sulphur dioxide to Sulphur trioxide is:

(a) Finely divided iron

(b) Graphite

(c) Vanadium pentoxide

(d) platinum

(v) Substitution reaction is a characteristic property of:

(a) Alcohols

(b) Alkanes

(c) Alkenes

(d) Alkynes

(vi) The gas evolved when dilute sulphuric acid reacts with iron sulphide:

(a) Sulphur dioxide

(b) Carbon dioxide

(c) Hydrogen sulphide

(d) Nitrogen dioxide

(vii) An acid obtained from concentrated nitric acid on reaction with Sulphur:

(a) Carbonic acid

(b) Sulphuric acid

(c) Nitric acid

(d) Hydrochloric acid

(viii) The hydroxide soluble in excess of ammonium hydroxide is:

(a) Zinc hydroxide

(b) Lead hydroxide

(c) Magnesium hydroxide

(d) Ferrous hydroxide

(ix) The chemical name of the principal ore of aluminium:

(a) Sodium aluminium fluoride

(b) Aluminium oxide

(c) Hydrated Aluminium fluoride

(d) Hydrated aluminium oxide

(x) A hydrocarbon which is a greenhouse gas.

(a) Acetylene

(b) Ethylene

(c) Ethane

(d) Methane

SECTION B

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

Question 2

(i) Define: [2]

(a) Catenation

(b) Alloy

(ii) Name the compound formed when: [2]

(a) Ethene reacts with hydrogen in the presence of a catalyst.

(b) Bauxite reacts with sodium hydroxide

(iii) Draw the structural diagram of: [3]

(a) Propanal

(b) Ethanoic acid

(c) 1,2 dichloroethane

(iv) Complete and balance the following chemical equations: [3]

(a) $C_2H_6 + O_2 \rightarrow$

(b) $C_2H_2 + I_2 \rightarrow$

(c) $NH_3 + HCl \rightarrow$

Question 3

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

(a) Compound Z 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 L on reacting with freshly prepared ferrous sulphate solution followed by addition of few drops of concentrated sulphuric acid to the reactants along the sides of a test tube forms a brown ring at the junction of the two liquids.

(ii) State the following: [2]

(a) The drying agent used in the laboratory preparation of HCl gas.

(b) Products formed when ammonia is burnt in excess of oxygen.

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

(a) Manganese dioxide reacts with concentrated HCl.

(b) A glass rod dipped in concentrated HCl acid is brought near ammonia gas.

(c) Concentrated sulphuric acid is added to carbon.

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

(a) Lead sulphate from lead nitrate and sulphuric acid.

(b) Nitrogen tri chloride from ammonia.

(c) Sodium chloride from sodium sulphite and dilute hydrochloric acid.

Question 4

(i) State the relevant reason for the following: [2]

(a) A layer of powered coke is used over the electrolytic mixture in Hall Heroult's process.

(b) Graphite anodes are continuously replaced during the electrolysis of alumina.

(ii) Name the alloys for the given composition: [2]

(a) Magnesium and aluminium

(b) Magnesium + Manganese + Aluminium + Copper

(iii) Identify the terms for the following: [3]

(a) The experiment which demonstrates high solubility of ammonia gas.

(b) A method used to collect HCl gas.

(c) The electrode where reduction takes place.

(iv) Complete the table given below: [3]

Name of the process	Reactants	Acid product formed
(a) _____	Nitrogen dioxide + water + oxygen	(b) _____
(c) _____	Oleum + water	Sulphuric acid

Question 5

(i) Write the balanced chemical equation to show the concentration of ore in Baeyer's process. [2]

(a) Sodium aluminate to aluminium hydroxide

(b) Aluminium hydroxide to alumina

(ii) Select the correct answer from the brackets to complete the following statements: [2]

(a) The catalyst used in the oxidation of ammonia is _____ [zinc / platinum].

(b) The product formed when ammonia reacts with oxygen is _____ [nitric oxide / nitrous oxide]

(iii) Name the following organic compound: [3]

(a) The compound with 3 carbon atoms whose functional group is a carboxylic acid

(b) The first homologue whose general formula is C_nH_{2n}.

(c) The compound formed by complete chlorination of ethyne.

(iv) Answer the following questions related to the laboratory preparation of the hydrogen chloride gas: [3]

(a) Why is sodium chloride preferred to other metallic chlorides?

(b) State the temperature required in the preparation.

(c) Write the chemical equation.

(i) Distinguish between the following: [2]

(a) Dilute HCl and dilute HNO_3[using silver nitrate solution]

(b) Dilute HCl and dilute H_2SO_4[using lead nitrate solution]

(ii) Give one word for the following statements: [2]

(a) Naturally occurring minerals from which metals are extracted.

(b) Organic compounds having the same molecular formula but different Structural formula.

(iii) A, B and C are the chemical properties of sulphuric acid: [3]

A. Oxidizing agent

B. Dehydrating agent

C. Non volatile acid

Match the following equations 1 to 3 to the above chemical properties of sulphuric acid.

1. $KNO_3 + H_2SO_4 \rightarrow KHSO_4 + HNO_3$
2. $C_{12}H_{22}O_{11} \rightarrow 12C + 11H_2O$
3. $S + 2H_2SO_4 \rightarrow 2H_2O + 3SO_2$

(iv) Study and complete the following table: [3]

Homologous series	Alkane	Alkyne
General formula	C_nH_{2n+2}	1. _____
IUPAC name	2. _____	Ethyne
Common name	Marsh gas	3. _____

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ICSE ACADEMY

Specimen Papers

- 2022

Semester 1

ICSE SEMESTER 1 EXAMINATION

SPECIMEN QUESTION PAPER

CHEMISTRY

SCIENCE PAPER - 2

Maximum Marks: 40

Time allowed: One hour (inclusive of reading time)

ALL QUESTIONS ARE COMPULSORY.

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

Select the correct option for each of the following questions.

Question 1

The trend in metallic nature of metals as we go from top to bottom in a group: [1]

1. increases
2. decreases
3. neither increases nor decreases
4. none of the above

Question 2

The colour change observed when the solution of magnesium hydroxide is tested with the following indicators: [1]

1. phenolphthalein turns colourless to pink
2. methyl orange remains orange
3. phenolphthalein remains colourless
4. blue litmus solution turns red

Question 3

The compound which is a non-electrolyte: [1]

1. KCl (aq)
2. H_2SO_4 (dil)
3. CCl_4 (l)
4. CH_3COOH (aq)

Question 4

Twice the vapour density gives: [1]

1. Actual vapour density
2. Relative vapour density
3. Molecular mass
4. Molar volume

Question 5

The number of lone pair of electrons in the nitrogen atom in ammonia molecule: [1]

1. One
2. Two
3. Three
4. Four

Question 6

Elements with similar valence shell configuration in a Periodic Table are placed in: [1]

1. different groups
2. same period
3. different period
4. same group

Question 7

The gas liberated when sodium sulphite reacts with dilute sulphuric acid: [1]

1. Carbon dioxide
2. Hydrogen
3. Hydrogen sulphide
4. Sulphur dioxide

Question 8

Thickness of metal coating during electroplating depends on: [1]

1. Duration of current passage
2. A low current
3. Nature of cathode
4. Purity of anode

Question 9

Ionic bonding is seen in: [1]

1. Methane
2. Hydrogen
3. Ammonia
4. Sodium oxide

Question 10

The molecular formula of an organic compound is $C_6H_{12}O_6$ and the empirical formula is CH_2O, the value of n is: [1]

1. 2
2. 6
3. 1
4. 12

Question 11

When an electron is added in the valence shell: [1]

1. energy is released
2. energy is absorbed
3. energy remains same
4. none of the above

Question 12

The most electronegative element is: [1]

1. Sodium
2. Aluminium
3. Bromine
4. Fluorine

Question 13

The bond in Carbon Tetrachloride is: [1]

1. Single Covalent Bond
2. Double Covalent Bond
3. Ionic bond
4. Triple Covalent Bond

Question 14

The type of bonding present in the nitrogen molecule: [1]

1. Single Covalent Bond
2. Double Covalent Bond
3. Polar Covalent bond
4. Triple Covalent Bond

Question 15

A compound with Empirical formula XY_2, has the vapour density equal to its Empirical formula weight, its molecular formula is [1]

1. X_2Y_4
2. X_2Y_2
3. XY
4. X_4Y_2

Question 16

Identify one statement that does not hold true for electrorefining of copper: [1]

1. Electrolyte is acidified $CuSO_4$ solution
2. Cathode is a thin strip of impure copper
3. Anode dissolves in the electrolyte
4. Anode gets thicker.

Question 17

The observation when ammonium chloride reacts with potassium hydroxide: [1]

1. A reddish brown gas
2. A colourless gas which turns moist red litmus blue.
3. A green coloured gas which turns moist blue litmus paper red.
4. A colourless gas which turns lime water milky.

Question 18

The colour of the precipitate formed when ferrous ions react with ammonium hydroxide solution: [1]

1. Blue
2. Reddish brown
3. Dirty green
4. white

Question 19

During ionisation, metals lose electrons this change can be called: [1]

1. Oxidation
2. Reduction
3. Redox
4. Displacement

Question 20

The oxide of a metal that reacts both with acid and alkali to form salt and water: [1]

1. Sodium oxide
2. Magnesium oxide
3. Aluminium oxide
4. Ferrous oxide

Question 21

The property which decreases from left to right across the periodic table: [1]

1. Electron affinity
2. Electro negativity
3. Ionisation energy
4. Metallic character

Question 22

On the basis of electronic configuration the period and group of B_5^9 is: [1]

1. 2 and IIIA
2. 3 and IIA
3. 4 and VIA
4. 5 and VIIA

Question 23

Select the ion that would get selectively discharged from the aqueous mixture of the ions listed below: [1]

1. SO_4^{-2}
2. NO_3^{-1}
3. OH^{-1}
4. Cl^{-1}

Question 24

Hydronium ion is formed when a molecule of water combines with: [1]

1. Hydrogen atom
2. Proton
3. Hydrogen molecule
4. Oxygen atom

Question 25

The condition that is most appropriate for electroplating with nickel: [1]

1. Electrolyte is molten copper sulphate
2. Anode should be made of impure nickel plate
3. Alternating current is used
4. Periodic replacement of cathode is needed.

Question 26

The hydroxide which is soluble in excess ammonium hydroxide: [1]

1. Lead hydroxide
2. Ferrous hydroxide
3. Zinc hydroxide
4. Ferric hydroxide

Question 27

Which statement is not true for electrolysis? [1]

1. Cations migrate towards cathode
2. Anions discharge at anode
3. Anions get reduced during electrolysis
4. Cations get reduced during electrolysis

Question 28

H_2Y is the formula of a compound. What is the valency exhibited by Y? [1]

1. 1
2. 2
3. 3
4. none of the above

Question 29

The particles which attract one another to form electrovalent compounds are: [1]

1. Electrons
2. Protons
3. Ions
4. Molecules

Question 30

Which one of the following statements is NOT correct? [1]

1. Pure water does not allow a current to flow through it.
2. The electrolyte only conducts when in the molten state.
3. Electrodes that react with the electrolytes are said to be “active”.
4. Ions must be present in the electrolyte in order that it conducts electricity.

Question 31

The salt formed by partial replacement of hydrogen ion of an acid by a basic radical. [1]

1. Sodium sulphite
2. Magnesium hydroxide
3. Potassium sulphate
4. Zinc hydrogen sulphite

Question 32

Alkali which dissociates only partially in aqueous solution: [1]

1. Lithium hydroxide
2. Calcium hydroxide
3. Potassium hydroxide
4. Sodium hydroxide

Question 33

The property that matches with elements of the halogen family are: [1]

1. They are chemically highly reactive
2. They are metallic in nature.
3. They are monoatomic in their molecular form.
4. They have one electron in the valence shell.

Question 34

Cathode is a reducing electrode because: [1]

1. It has less number of electrons.
2. It has deficiency of electrons
3. Cations gain electrons from cathode
4. Anions lose electrons to cathode

Question 35

The simplest ratio of the atoms of carbon and hydrogen is 1:1. Identify the possible molecular formula. [1]

1. C_6H_6
2. C_2H_4
3. C_6H_2
4. C_3H_4

Question 36

The empirical formula of the compound is CH_2O, the possible molecular formula can be: [1]

1. $C_3H_6O_3$
2. C_2H_4O
3. $C_4H_3O_2$
4. $C_4H_6O_2$

Question 37

Observe the Periodic Table to answer the questions: [4]

Group No.	1-1A	2-IIA	13-IIIA	14-IVA	15-VA	16-VIA	17-VIIA	18-0
2^{nd} period	Li		D			O	J	Ne
3^{rd} period	A	Mg	E	Si		X	M	
4^{th} period	R	T	G		Q	Y		Z

In the above table some elements are mentioned with their own symbol and position of the Periodic Table while others are shown with a letter. Answer the following questions pertaining to the same.

(a) Identify the most electronegative element.

1. Li.
2. Ne
3. Z
4. J

(b) How many Valence electrons are present in Q?

1. 3
2. 5
3. 15
4. 4

(c) The formula of the compound formed between E and O is

1. EO
2. E_3O_2
3. E_2O_3
4. EO_3

(d) The type of bond formed between A and X:

1. Ionic bond
2. Metallic bond
3. Covalent bond
4. Coordinate bond

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