

FULL SYLLABUS TEST

Class: X ICSE

CHEMISTRY

Full Marks: 80

Time: 2 hours

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

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

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

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

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

The intended marks for 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) The 2nd homologue of alkene is

(a) ethene	(b) propene	(c) ethane	(d) ethyne
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- (ii) Number of structural isomer of C₅H₁₂

(a) two	(b) three	(c) four	(d) five
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- (iii) The ion having more preferential discharge to anode is

(a) NO ₃ ⁻	(b) SO ₄ ²⁻	(c) Cl ⁻	(d) Br ⁻
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- (iv) The gas evolved from anode during electrolysis of molten PbBr₂

(a) O ₂	(b) H ₂	(c) Br ₂	(d) none
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- (v) **Assertion (A):** NH₃ is basic compound.
Reason (R): NH₃ produces hydronium ion in aqueous solution.

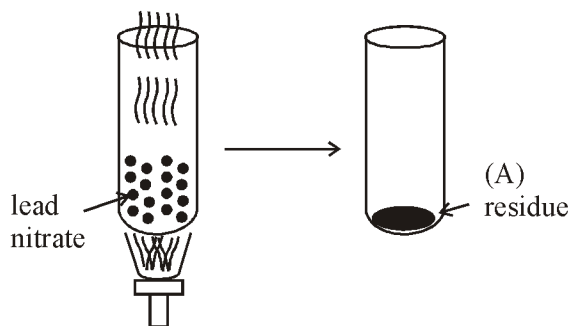
(a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true but R is not the correct explanation of A.
(c) A is true but R is false.
(d) A is false but R is true.
- (vi) The reducing agent from the reaction $6\text{HNO}_3 + \text{S} \rightarrow \text{H}_2\text{SO}_4 + 6\text{NO}_2 + 2\text{H}_2\text{O}$

(a) HNO ₃	(b) S	(c) H ₂ SO ₄	(d) NO ₂
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- (vii) The colourless gas evolved when NH₃ reacts with CuO is

(a) O ₂	(b) H ₂	(c) N ₂	(d) Cu
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- (viii) Identify covalent compound

(a) NaCl	(b) MgCl ₂	(c) CaCl ₂	(d) CCl ₄
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- (ix) The element present in period-3, group 16 is
 (a) K (b) P (c) Br (d) S
- (x) Suffix used for alcohol is
 (a) Al (b) Ol (c) One (d) Oic acid
- (xi) Which of the following acid is tribasic?
 (a) H_3PO_3 (b) H_3PO_4 (c) H_2SO_4 (d) CH_3COOH
- (xii) The hydroxide dissolved in excess NH_4OH is
 (a) $\text{Pb}(\text{OH})_2$ (b) $\text{Fe}(\text{OH})_3$ (c) $\text{Fe}(\text{OH})_2$ (d) $\text{Zn}(\text{OH})_2$
- (xiii) The electrolyte contains both ions and molecules is
 (a) dil. HCl (b) aq. KOH (c) acetic acid (d) none of these
- (xiv) The compound having highest boiling point
 (a) CO_2 (b) NH_3 (c) CCl_4 (d) NaCl
- (xv) Colour of residue (A) obtained from the reaction is

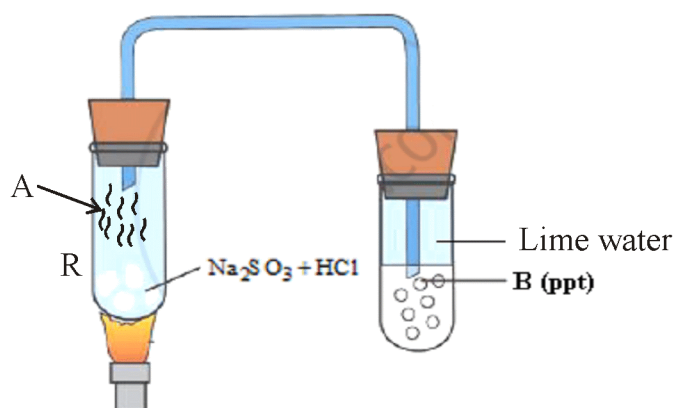


- (a) Black (b) Green (c) Yellow (d) Pink

Question 2

(i)

5



Give the answer from the following diagram.

- Name the gas (A) evolved
- Name and write the formula of B (ppt).
- Write the balanced equation takes place in flask (R).
- Write the chemical equation takes place when gas A is passed through lime water limited amount.
- Name the acid obtained when gas A is passed through water.

(ii) Match the following Column A and Column B. 5

Column A

Column B

- | | |
|-----------------------------|--------------------------|
| (a) HNO_3 | (1) Refining |
| (b) H_2SO_4 | (2) Haber's process |
| (c) NH_3 | (3) Hall heroult process |
| (d) Al extraction | (4) Ostwald process |
| (e) Purification of metal | (5) Contact process |

(iii) Complete the following by choosing the correct answers from the following bracket. 5

- (a) The element having highest ionisation potential _____ (Cs / F / He)
 (b) The element having highest electron affinity _____ (Cl / F / Li)
 (c) The amphoteric oxide is _____ (MgO / K_2O / ZnO)
 (d) Compound having two shared pair and two lone pair of electrons is _____ (H_2O / NH_3 / N_2)
 (e) Compound that can oxidise NH_3 to N_2 is _____ (H_2SO_4 / HNO_3 / Cl_2)

(iv) Identify the following: 5

- (a) Blue salt that form pale blue ppt in NH_4OH but dissolves in excess NH_4OH .
 (b) Sulphate salt that form gelatinous white ppt in NaOH and dissolves in excess solution.
 (c) White ppt which is soluble in excess NH_4OH solution but insoluble in other mineral acid.
 (d) Nitrate salt which does not leave any residue on heating.
 (e) Yellow explosive compound formed when NH_3 reacts with excess Cl_2 .

(v) (a) Draw the electron structure of the following compounds. 3 + 2

- (A) CCl_4 (B) Na_2O (C) NH_4^+

(b) Write down the chemical equation of the following reactions.

- (A) Zn reacts with concentrated H_2SO_4 . (B) NH_3 is burnt in air.

SECTION – B

(Answer any four questions)

Question 3

2 + 2 + 3 + 3

(i) Aqueous solution of copper sulphate is electrolysed using graphite electrode.

- (a) What happens to cathode?
 (b) What happens to electrolyte?

(ii) Name the products and balance the equations.

- (a) $(\text{NH}_4)_2\text{SO}_4 + \text{NaOH} \rightarrow$
 (b) $\text{Mg}_3\text{N}_2 + \text{H}_2\text{O} \longrightarrow$

(iii) H, Li, Be, B, C, N, O, F, Ne, Na, Mg, Al, Si, P, S, Cl, Ar, K, Ca

Amongst the list of elements given above pick out:

- (a) Element with smallest atomic radius
 (b) Most electronegative element
 (c) Noble gas in 3rd period

(iv) (a) The metal which does not react with dilute H_2SO_4 but reacts with conc. H_2SO_4 is _____

(Al / Cu / Zn / Fe)

(b) The metal of which oxide is amphoteric, reduced to metal by carbon reduction is _____

(Fe / Mg / Pb / Al)

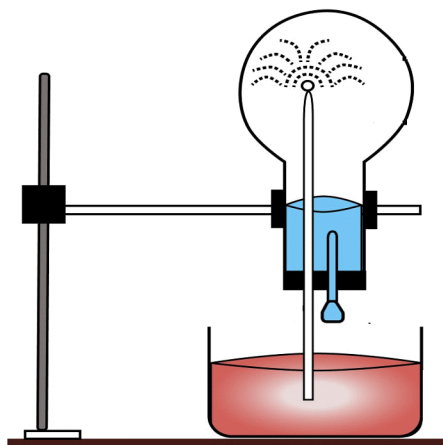
(c) The divalent metal whose oxide is reduced to metal by electrolysis of its fused salt is _____

(Al / Na / Mg / K)

Question 4

2 + 2 + 3 + 3

- (i) Following questions relate to Ostwald process.
- Write down the conditions maintained on catalytic chamber.
 - Write down the chemical reaction occurring in absorption tower.
- (ii) Give reason to the following questions:
- HNO_3 is prepared by heating KNO_3 with conc. H_2SO_4 below 200°C temperature
 - In Haber's process nitrogen is heated with hydrogen at optimum temperature
- (iii) Give balanced equation for each of the following
- Zinc oxide reacts with excess NaOH
 - $\text{Al}_2\text{O}_3 + \text{NaOH (excess)} \rightarrow$
 - Lead nitrate reacts with excess caustic potash solution.
- (iv) The diagram shows a simple arrangement of the fountain experiment:



- Name the two gases which can be used in this experiment.
- What is the common property demonstrated by this experiment.
- Name the drying agents which are used to dry the above mentioned gases during laboratory preparation.

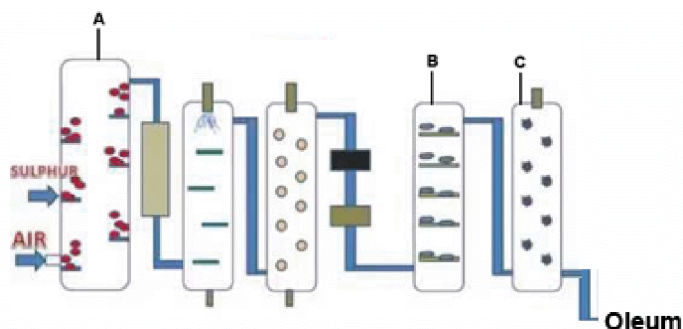
Question 5

2 + 2 + 3 + 3

- (i) Element A is present on period-3 and group-17 and element B is present in period-2 group-14
- predict the chemical formula when A combines with B
 - physical state of the compound
- (ii) Give reason for using
- Al in duralumine
 - carbon in stainless steel
- (iii) Arrange the following increasing order as described below
- Na, Al, Mg, P (atomic size)
 - Ar, P, S, Si (Ionisation potential)
 - O, F, N, Li (non metallic character)

(iv) The following diagram based on the industrial preparation of H_2SO_4 .

Contact Process



- Identify chamber A, B.
- Write the chemical reaction occurring in chamber A, C.
- What is the purpose of using Tyndall box?

Question 6

2 + 2 + 3 + 3

- Name the following
 - The acid gives only carbon monoxide by the dehydration with conc. H_2SO_4
 - Compounds obtained when Ammonia reacts with oxygen by heating with O_2 in presence of Pt catalyst.
- Fill in the blanks with suitable word
 - The ion discharged at anode during electrolysis of acidic water is _____.
 - Anode is called _____ electrode (irrespective charge)
- Identify oxidation and reduction reaction and electrode
 - $\text{Fe}^{3+} + \text{e}^- \rightarrow \text{Fe}^{2+}$
 - $4\text{OH}^- - 4\text{e}^- \rightarrow 2\text{H}_2\text{O} + \text{O}_2 \uparrow$
 - $\text{Ag} - \text{e}^- \rightarrow \text{Ag}^+$
- State the observation in the following cases
 - Dilute sulphuric acid is added to barium chloride solution.
 - Concentrated H_2SO_4 is added to blue vitriol
 - Blue litmus is added to aqueous solution of ammonium chloride

Question 7

2 + 2 + 3 + 3

- A gaseous hydrocarbon of vapour density 29, contains 82.76% of carbon. Calculate its empirical formula and molecular formula. [C = 12, H = 1]
- Find out the percentage composition of following elements
 - Oxygen in washing soda
 - Carbon in Sodium bicarbonate
[Na = 23, O = 16]
- 12.25 g of KClO_3 is heated.
 $2\text{KClO}_3 \rightarrow 2\text{KCl} + 3\text{O}_2$
 - Calculate the amount of residue left after the reaction.
 - Calculate weight lose.
 - Calculate the volume of O_2 obtained at STP.
[K-39, Cl-35.5]

- (iv) A gas cylinder can hold 1 kg of hydrogen at room temperature and pressure:
- Find out the number of moles of hydrogen present.
 - Find out the weight of CO_2 present in the cylinder under similar condition ($\text{H} = 1$, $\text{C} = 12$, $\text{O} = 16$)
 - If the number of molecules of hydrogen in the cylinder is X , calculate the number of CO_2 molecules in the cylinder under the same condition.

Question 8

2 + 2 + 3 + 3

- State giving reason.
 - Most of the compounds contain carbon
 - Alkane gives substitution reaction but alkene gives addition reaction
- Draw the structure of
 - 2, 3-dimethyl pentane
 - Iso-butane
- Write the IUPAC name of organic compound obtained from the following reaction
 - Sodium acetate is treated with sodalime
 - Ethene reacts with hydrogen in presence of platinum catalyst
 - Ethanoic acid reacts with ethanol in presence of conc. H_2SO_4
- Match the Column A with Column B

Column A

- Dehydrohalogenation of ethyl bromide
- Wurtz reaction of methyl chloride
- Calcium carbide reacts with water

Column B

- Ethyne
- Ethene
- Ethane