

CHEMISTRY
SCIENCE Paper – 2
(One hour and a half)

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 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

- (a) Choose the most appropriate answer.
- (i) Which of the following is a common characteristic of a covalent compound?
A High melting point.
B Conducts electricity when it is in the molten state. C
Consists of molecules.
D Always soluble in water.
- (ii) 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
- (iii) A salt which in solution gives a bluish white precipitate with NaOH solution and a white precipitate with BaCl_2 solution is:
A CuSO_4
B FeSO_4
C $\text{Fe}_2(\text{SO}_4)_3$
D CuCl_2

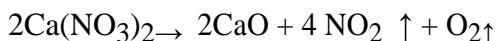
- (iv) The gas law which relates the volume of a gas to moles of the gas is: A
Avogadro's Law
B Gay-Lussac's Law C
Boyle's Law
D Charle's Law
- (v) During the electrolysis of acidified water which of the following takes place: A
Oxygen is released at cathode.
B Oxygen is released at anode. C
Hydrogen is released at anode.
D Sulphur dioxide is released at anode.
- (vi) Duralumin is an alloy of A
Al and Cu
B Cu and Sn C Al
and Ag D Al and Fe
- (vii) Hydrogen chloride can be obtained by adding concentrated Sulphuric acid to:
A NaCl
B Na₂SO₄
C Na₂CO₃
D NaNO₃.
- (viii) Which of the following reactions gives copper as a product
A Passing dry ammonia over heated copper oxide.
B Adding dilute hydrochloric acid to copper oxide.
C Heating copper oxide.
D Passing oxygen over heated copper oxide?
- (ix) Formation of chloroform from methane and chlorine is an example of:
A Addition
B Dehydration
C Substitution
D Elimination.

(x) The element with the highest ionization potential in the periodic table is:

- A He
- B Ne
- C Ar
- D Xe

[10]

(b) The equation for the action of heat on calcium nitrate is:



- (i) How many moles of NO_2 are produced when 1 mole of $\text{Ca}(\text{NO}_3)_2$ decomposes?
- (ii) What volume of O_2 at S.T.P. will be produced on heating 65.6 g of $\text{Ca}(\text{NO}_3)_2$?
- (iii) Find out the mass of CaO formed when 65.6 g of $\text{Ca}(\text{NO}_3)_2$ is heated.
- (iv) Find out the mass of $\text{Ca}(\text{NO}_3)_2$, required to produce 5 moles of gaseous products.
- (v) Find out the mass of $\text{Ca}(\text{NO}_3)_2$ required to produce 44.8 L of NO_2 at S.T.P.
(Relative molecular mass of $\text{Ca}(\text{NO}_3)_2 = 164$ and of $\text{CaO} = 56$)

[5]

(c) Name the organic compound prepared by each of the following reactions:

- (i) $\text{CH}_3\text{COONa} + \text{NaOH}$ [redacted]
- (ii) $\text{CaC}_2 + \text{H}_2\text{O}$ [redacted]
- (iii) $\text{C}_2\text{H}_5\text{Br} + \text{KOH (alc)}$ [redacted]
- (iv) $\text{C}_2\text{H}_5\text{Br} + \text{KOH (aq)}$ [redacted]
- (v) $\text{C}_2\text{H}_5\text{OH} + \text{CH}_3\text{COOH}$ [redacted]

[5]

(d) Identify the following substances:

- (i) An acidic gas which gives dense white fumes with NH_3 .
 - (ii) An alkane which can also be called a green house gas.
 - (iii) A solid which when kept in the open, forms a solution after sometime.
 - (iv) An alloy used in electrical fittings.
 - (v) A metal which gives hydrogen gas on reacting with both dilute acid and alkali.
- [5]

(e) Write equations for the following reactions:

(i) Aluminium oxide and Sodium hydroxide.

(ii) Zinc and dilute sulphuric acid.

(iii) Nitrogen dioxide and water.

(iv) Concentrated sulphuric acid and sugar.

(v) Copper with concentrated nitric acid.

[5]

(f) Name the following:

(i) Second member of alkene series

(ii) First member of alkane series

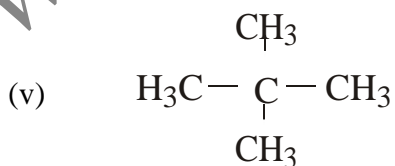
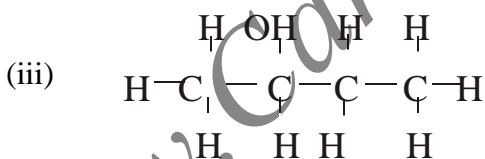
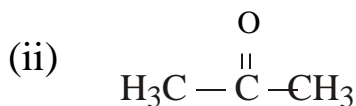
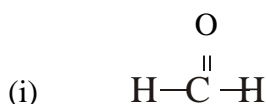
(iii) Third member of aldehyde series.

(iv) Second member of carboxylic acid.

(v) Fourth member of alcohol series.

[5]

(g) Write the I.U.P.A.C. names of the following compounds:



[5]

SECTION II (40 Marks)

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

Question 2.

- (a) The following questions refer to the periodic table:
- (i) Name the second last element of the period 3.
 - (ii) How many elements are in the second period?
 - (iii) Name the element which has the highest electron affinity.
 - (iv) Name the element which has the highest electro negativity.
 - (v) Name the element which may be placed on group 1 but is not a metal. [5]
- (b) Fill in the blanks using the correct options:
- (i) Metals have ----- ionisation potential. (low/ high)
 - (ii) Group 18 elements have ----- valence electrons (4 / 8) with the exception of ---- (He / Ne) with ----- electrons (2 / 8) in valence shell.
 - (iii) Group 2 elements are called ----- metals (alkali / alkaline earth). [5]

Question 3.

- (a) Draw different isomers having the following molecular formula:
- (i) C_5H_{12} (chain)
 - (ii) C_4H_8 (position). [5]
- (b) What is denatured alcohol? [1]
- (c) Give two important uses of ethanol. [2]
- (d) Write equations for:
- (i) Preparation of ethanol by hydration of C_2H_4 .
 - (ii) Preparation of acetic acid from ethanol. [2]

Question. 4

- (a) Name the method by which following compounds can be prepared:

Select the appropriate method from the following list Neutralization; direct combination; precipitation; metal + acid – use a method only once.

- (i) Sodium sulphate
- (ii) Silver chloride
- (iii) Iron sulphide.

[3]

- (b) How will you distinguish between following pairs of compounds using NH_4OH .

- (i) Copper sulphate and iron(II) sulphate.
- (ii) Zinc nitrate and lead nitrate.
- (iii) Iron(II) sulphate and iron(III) sulphate.

[3]

- (c) Name:

- (i) A greenish yellow gas with pungent smell.
- (ii) An oxide which is yellow when hot and white when cold.
- (iii) A chemical used to deplete ozone layer.
- (iv) A crystalline salt without water of crystallization.

[4]

Question. 5

- (a) Name one:

- (i) metal liquid at room temperature.
- (ii) non-metal which is a conductor of electricity.
- (iii) neutral oxide.
- (iv) metallic oxide which cannot be reduced by hydrogen.
- (v) non-metal which has lustre.

[5]

- (b) (i) Name the chief ore of aluminium.
- (ii) Name the process used to concentrate the above mentioned ore.
- (iii) Why is alumina added to cryolite in the electrolytic reduction of aluminium?
- (iv) Give cathode and anode reactions involved in extraction of aluminium

from its above mentioned ore.

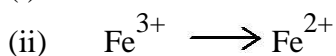
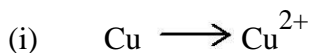
- (v) Name the process used for the concentration of zinc blende. [5]

Question 6.

- (a) Draw a neat and well labelled diagram for the silver plating on an iron spoon. [3]
- (b) Copy and complete the following table related to electrolysis.

S.No.	Name of Electrolyte	Name of Cathode	Name of Anode	Product at Cathode	Product at Anode
1.	CuSO ₄ (aq.)	Copper	Copper		
2.	PbBr ₂ (molten)	Platinum	Platinum		

- (c) Classify the following as oxidation and reduction reaction, also complete the reaction. [4]



[3]

Question. 7

- (a) A compound has the following percentage composition by mass:

Carbon – 54.55%, Hydrogen – 9.09% and Oxygen – 36.26%. Its vapour density is 44. Find the Empirical and Molecular formula of the compound.

- (H = 1; C = 12; O = 16) [5]

- (b) Give the electron dot structure of the following:



[3]

- (c) Compare the properties of covalent and electrovalent compounds on the following points:

(i) Solubility

(ii) Structure.

[2]