
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.

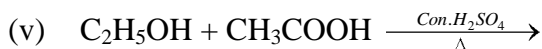
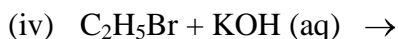
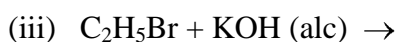
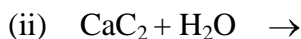
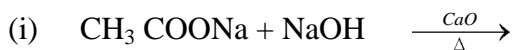
(iv) Find out the mass of $\text{Ca}(\text{NO}_3)_2$, required to produce 5 moles of gaseous products.

(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:



[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.

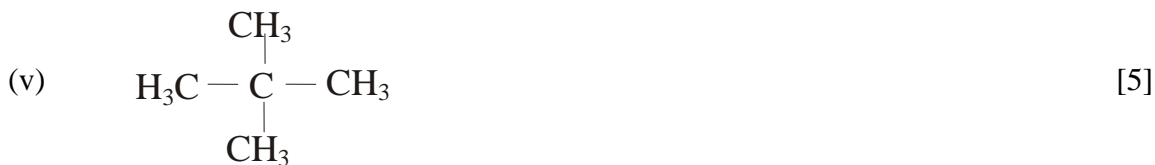
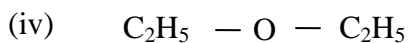
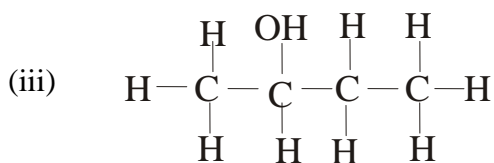
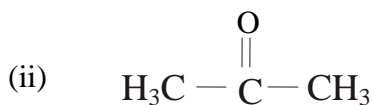
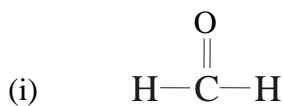
(v) A metal which gives hydrogen gas on reacting with both dilute acid and alkali. [5]

(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:



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.

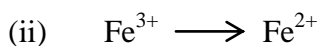
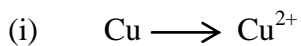
(a) Draw a neat and well labelled diagram for the silver plating on an iron spoon. [3]

(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		

[4]

(c) Classify the following as oxidation and reduction reaction, also complete the reaction.

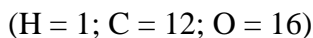


[3]

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.



[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]