



SCIENCE
PAPER 2 (Chemistry)
(Two Hours)

*Answer to this paper must be written on the paper 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 (40 Marks)

Attempt all questions from this Section.

Question 1

- (a) Choose the correct answer from the options given below: - [10]
- (i) A chloride which forms a reddish-brown precipitate that is insoluble in excess of ammonium hydroxide, is:
(A) Calcium chloride (B) Ferrous chloride
(C) Ferric chloride (D) Copper chloride
- (ii) If the molecular formula of an organic compound is $C_{10}H_{20}$ it is :
(A) Alkene (B) Alkane
(C) Alkyne (D) Not a hydrocarbon
- (iii) Which of the following is not a characteristic of an electrovalent compound?
(A) High melting point (B) consists of molecules
(C) Always soluble in water (D) conducts electricity when it is in the molten state
- (iv) On moving from left to right across a period electronegativity character of elements:
(A) Decreases (B) Increases
(C) Remains same (D) Depends on the period

(v) Which of the following involves coordinate bonding:

- (A) CCl_4 (B) H_2
(C) HCl (D) NH_4Cl

(vi) Dilute hydrochloric acid will produce a white precipitate when added to a solution of:

- (A) Copper nitrate (B) Zinc nitrate
(C) Silver nitrate (D) Sodium nitrate

(vii) Name the gas evolved when sodium hydroxide and ammonium chloride is heated:

- (A) Ammonia (B) Nitrogen
(C) Nitrogen dioxide (D) Chlorine

(viii) A covalent molecule contains three single covalent bond is:

- (A) Water (B) Ammonia
(C) Methane (D) Oxygen

(ix) During the electrolysis of molten lead bromide, which of the following takes place?

- (A) Bromine is released at the cathode (B) Lead is deposited at the anode
(C) Bromine ions gain electrons (D) Lead is deposited at the cathode

(x) Ammonia added with sulphuric acid forms:

- (A) Ammonium sulphate (B) Ammonium nitrite
(C) Magnesium nitride (D) Magnesium nitrate

(b) Identify the following: [5]

- (i) A gas which burns with pop sound.
(ii) A gas which turns moist starch iodide paper- blue black.
(iii) Gas C has an offensive smell like rotten eggs.
(iv) Colour of Nitrogen dioxide gas.
(v) Colour of Sodium ion in flame test.

(c) Write the equation for the following reactions: [5]

- (i) Ammonia with nitric Acid.
(ii) Catalytic oxidation of ammonia.
(iii) Calcium oxide with hydrogen chloride.
(iv) Manganese dioxide with conc. Hydrochloric acid.
(v) Lead nitrate with solution of ammonium hydroxide.

- (d) Sodium hydroxide solution is added first in small quantity, then in excess to the aqueous salt solutions of copper (II) sulphate, calcium chloride and iron (III) sulphate. Complete the table given below: [6]

Aqueous salt solution	Color of precipitate when NaOH is added in a small quantity	Nature of precipitate (soluble or insoluble) when NaOH is added in excess
Copper (II) sulphate	(i)	(ii)
Calcium chloride	(iii)	(iv)
Iron (III) sulphate	(v)	(vi)

- (e) **M** is an element in the form of powder. **M** burns in oxygen and the product is soluble in water. The solution is tested with litmus. Write down only the word which will correctly complete each of the following sentences. [5]

- (i) If **M** is a metal, then the litmus will turn _____.
- (ii) If **M** is non-metal, then the litmus will turn _____.
- (iii) If **M** is a reactive metal, then _____ will be evolved when **M** reacts with dilute sulphuric acid.
- (iv) If **M** is a metal, it will form _____ oxide, which will form _____ solution with water.
- (v) If **M** is a non-metal, it will not conduct electricity in _____ state.

- (f) Give the structural formula for the following: [4]

- (i) 2,2-dimethyl pentane.
- (ii) Ethanal.
- (iii) 3-methyl pent-2-ene.
- (iv) 2-methyl butane.

- (g) Answer the following: [5]

- (i) The tendency of an atom to attract electrons to itself when combined in a compound.
- (ii) A gas which turns moist lead acetate paper- silvery black.
- (iii) Common Ore of Aluminum.
- (iv) Percentage of C in Carbon dioxide. (C=12, O=16).

SECTION B (40 Marks)**[Attempt any four questions from this Section.]****Question 2**

(a) With reference to the first three periods of the modern periodic table, answer the following questions: [4]

(i) Write the formula of the sulphate of the element with atomic number 12.

(ii) Name the element which has greatest ionization potential.

(iii) How many electrons are present in the valence shell of the element with atomic number 20?

(iv) State the number of elements in period 2.

(b) Write the equations for each of the following reactions: [3]

(i) Sulphur is heated with concentrated sulphuric acid.

(ii) Concentrated sulphuric acid is poured over sugar.

(iii) Dilute sulphuric acid is mixed with barium chloride solution.

(c) Acids dissolve in water to produce positively charged ions. Draw an electron dot diagram to show the structure of these ion. State the type of bonding present in it. Name the ion formed. [3]

Question 3

(a) State the volume occupied by 40 g of a hydrocarbon – CH_4 at s.t.p. if its V.D. is 8. [3]

(b) Four atoms are labelled from A to D. On the basis of given information answer the following: [3]

Atoms	Mass number	Atomic number
A	19	9
B	7	3
C	23	11
D	14	7

(i) Which element has three shells?

(ii) Type of bond formed between A and B.

(iii) Which element contains 7 neutrons ?

] (c) Complete the table :

[4]

Common name	Chemical name	Chemical Formula
Cryolite	(i)	(ii)
(iii)	Calcium oxide	(iv)

Question 4

(a) (i) Give balanced chemical equations for the action of Hydrochloric acid on each of the following: [2]

(1) FeS. (2) CuO

(b) (i) Copy and complete the following table: [6]

Application	Anode	Cathode	Electrolyte
Electroplating with- Nickel			
Electrorefining of Copper			

(c) Calculate the percentage of Sodium[Na] in $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$. [H=1, B=11, O=16, Na=23] [2]

Question 5

(a) An element P has atomic number 16. Answer the following questions on P: [4]

(i) State the period and group to which P belongs.

(ii) Is P a metal or a non-metal?

(iii) State the formula between P and Hydrogen.

(iv) What kind of a compound is this?

(b) Draw the electron dot diagram for the compounds given below. Represent the electrons by (.) and(x) in the diagram. [2]

(i) Calcium oxide

(ii) Nitrogen.

(c) Determine the empirical formula of the compound whose composition by mass is:

42% nitrogen, 48% oxygen , and 9% hydrogen . [H=1, N=14, O=16]. [4]

Question 6

(a) Copy and complete the following table relating do the important industrial process. [4]

Name the process	Inputs	Catalyst	Eq. for catalyzed reaction.	Output
(i)	(ii)	(iii)	(iv)	Nitric acid

(b) Identify the gas evolved when: [2]

(i)Zinc is treated with dil. Hydrochloric acid.

(ii) Nitric oxide is added with Oxygen.

(c) In the laboratory preparation of hydrochloric acid, HCl gas is dissolved in water. [2]

(i) Name the arrangement used for the absorption of HCl gas in water.

(ii)Why is such an arrangement necessary? Give reason.

(d)Write the chemical equations for the laboratory preparation of HCl gas when the reactants are:

(A) below 200⁰C

(B) above 200⁰C

[2]

Question 7

(a) Draw the structures of isomers of Butane. [2]

(b) The questions below are related to laboratory preparation method of Ammonia from Ammonium salt: [5]

(i) State the reactants.

(ii) State the ratio of reactants.

(iii) Name the method of collection.

(iv) State the drying agent used.

(v)Why ammonium nitrate is not used as a reactant.

(c) Complete the following paragraph using the options given in brackets: [3]

Alkenes are a homologous series of (i) _____(saturated/ unsaturated) hydrocarbons. Alkenes undergo (ii)_____ (addition/substitution) reactions and also undergo (iii)____(hydrogenation/dehydrogenation) to form alkanes.
