

**KUMAR CLASSES**

INSPIRE · INNOVATE · EXCEL

ICSE Class 10 · Chemistry (Science Paper – 2)

Sample Question Paper — Set 3 | Session 2026

Time : 2 Hours**Reading time : 15 min****Max. Marks : 80**

Name : Roll No. : Date :

General Instructions

1. Answers to this paper must be written on the paper provided separately.
2. **Section A is compulsory.** Attempt **any four** questions from **Section B**.
3. The intended marks for questions are given in brackets [].
4. Atomic masses: H=1, C=12, N=14, O=16, Na=23, Mg=24, S=32, Cl=35.5, Ca=40, Zn=65.

SECTION A — 40 Marks*(Attempt **all** questions from this Section)***Question 1.****[15]***Choose the correct answers to the questions from the given options.***(i) The percentage of calcium in calcium carbonate (CaCO_3) is:**

- | | |
|---------|---------|
| (a) 40% | (b) 12% |
| (c) 48% | (d) 20% |

(ii) On moving left to right across a period, the non-metallic character:

- | | |
|--------------------|------------------|
| (a) decreases | (b) increases |
| (c) stays constant | (d) becomes zero |

(iii) The molecule that contains only single covalent bonds is:

- | | |
|-------------------|-------------------|
| (a) O_2 | (b) N_2 |
| (c) CH_4 | (d) CO_2 |

(iv) Which of the following is an ionic compound?

- | | |
|---------|-------------------|
| (a) HCl | (b) CO_2 |
| (c) KCl | (d) NH_3 |

(v) A salt of a strong base and a weak acid is:

(a) NaCl

(b) NH_4Cl

(c) CH_3COONa

(d) Na_2SO_4

(vi) Universal indicator turns green in a solution of pH:

(a) 3

(b) 7

(c) 10

(d) 1

(vii) The mass of 0.5 mole of oxygen gas (O_2) is:

(a) 8 g

(b) 16 g

(c) 32 g

(d) 4 g

(viii) 11.2 L of a gas at STP contains:

(a) 1 mole

(b) 0.5 mole

(c) 2 moles

(d) 0.25 mole

(ix) The number of molecules in 0.5 mole of a gas is:

(a) 6.02×10^{23}

(b) 3.01×10^{23}

(c) 1.2×10^{24}

(d) 3.01×10^{22}

(x) An element with atomic number 11 belongs to:

(a) Group 1

(b) Group 11

(c) Group 17

(d) Group 18

(xi) The most reactive metal among the following is:

(a) Li

(b) Na

(c) K

(d) Ca

(xii) The valency of an element with configuration 2, 8, 6 is:

(a) 2

(b) 6

(c) 4

(d) 8

(xiii) When an acid reacts with a base, the reaction is called:

(a) oxidation

(b) neutralisation

(c) displacement

(d) precipitation

(xiv) The gas evolved when dilute HCl reacts with sodium carbonate is:

(a) H_2

(b) O_2

(c) CO_2

(d) Cl_2

(xv) The percentage of nitrogen in ammonium sulphate $(NH_4)_2SO_4$ is:

(a) 14%

(b) 21.2%

(c) 28%

(d) 35%

Question 2.

[25]

(i) The table shows a part of the Periodic Table (letters are **not** actual symbols). Answer the questions that follow. **[5]**

Group →	I	II	III	IV	V	VI	VII	0
Period 2	A				B			C
Period 3	D	E				F	G	

- Which element is a noble gas?
- Which element has 5 electrons in its valence shell?
- Which is the most reactive metal?
- Which element forms an ion with a 2+ charge?
- State the valency of element F.

(ii) Name the following: **[5]**

- The number of electrons in the outermost shell of an inert gas (other than helium).
- A non-metal that is a liquid at room temperature.
- A salt formed by partial replacement of the hydrogen of a dibasic acid.
- The mass of one mole of carbon dioxide.
- The bond formed by the complete transfer of electrons.

(iii) Match Column A with Column B: **[5]**

Column A	Column B
1. $CaCl_2$	(P) a covalent molecule
2. Cl_2	(Q) an electrovalent compound
3. An alkali	(R) a cation
4. Ca^{2+}	(S) pH greater than 7
5. Atomic size across a period	(T) decreases

(iv) Fill in the blanks: **[5]**

- The formula mass of $CaCO_3$ is _____.
- Non-metallic character _____ across a period.
- Since NaCl is a salt of a strong acid and

a strong base, it is _____ in nature. 4. 22.4 litres of any gas at STP contains _____ mole. 5. In an ionic bond, electrons are _____ from one atom to another.

- (v) [5] 1. Balance: $\text{Fe} + \text{H}_2\text{O} \rightarrow \text{Fe}_3\text{O}_4 + \text{H}_2$. 2. Write the equation for dilute HCl reacting with sodium carbonate. 3. Calculate the percentage of nitrogen in $(\text{NH}_4)_2\text{SO}_4$. 4. Calculate the mass of 0.5 mole of oxygen molecules (O_2). 5. Draw the electron-dot structure of methane (CH_4).

SECTION B – 40 Marks

(Attempt **any four** questions from this Section)

Question 3. [Periodic Table]

[10]

- (a) Define: (i) a period (ii) a group in the Periodic Table. [2]
(b) Arrange in **increasing** order of non-metallic character and give a reason: Na, Mg, Si, Cl. [3]
(c) Why does the metallic character decrease across a period? [2]
(d) An element X has the configuration 2, 8, 6. (i) State its group and period. (ii) State its valency. (iii) Is it a metal or non-metal? [3]

Question 4. [Chemical Bonding]

[10]

- (a) Draw the electron-dot structures of: (i) methane (CH_4) (ii) calcium chloride (CaCl_2). [4]
(b) Explain the formation of calcium oxide (CaO) by transfer of electrons. ($\text{Ca} = 2, 8, 8, 2$; $\text{O} = 2, 6$) [3]
(c) State **three** differences between electrovalent and covalent compounds. [3]

Question 5. [Acids, Bases and Salts]

[10]

- (a) Define: (i) a base (ii) a salt. [2]
(b) What is meant by (i) a strong acid (ii) a weak acid? Give one example of each. [3]
(c) State what you observe when dilute HCl is added to sodium carbonate. [1]
(d) Name the method of preparation for: (i) sodium chloride (ii) lead sulphate (an insoluble salt). [4]

Question 6. [Mole Concept and Stoichiometry]

[10]

- (a) Define: (i) STP (ii) molar mass. [2]

(b) Calculate the percentage of nitrogen in ammonium sulphate, $(\text{NH}_4)_2\text{SO}_4$. [2]

(c) 8.4 g of magnesium carbonate is heated: $\text{MgCO}_3 \rightarrow (\Delta) \text{MgO} + \text{CO}_2$. Calculate (i) the mass of CO_2 (ii) its volume at STP. ($\text{Mg} = 24$) [3]

(d) A compound of carbon and oxygen contains 27.3% carbon and 72.7% oxygen. Find its empirical formula. [3]

Question 7. [Mixed]

[10]

(a) State the change across a period for: (i) ionisation energy (ii) metallic character. [2]

(b) Name the type of bond in: (i) MgCl_2 (ii) H_2O . [2]

(c) Give one word: (i) a water-soluble base (ii) a salt whose aqueous solution turns blue litmus red. [2]

(d) In $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$, find the volume of oxygen required to react completely with 10 L of hydrogen (same conditions). [2]

(e) Balance: $\text{NH}_3 + \text{O}_2 \rightarrow \text{NO} + \text{H}_2\text{O}$. [2]

ANSWER KEY & MARKING SCHEME – Set 3

Question 1 (MCQ)

(i) a (ii) b (iii) c (iv) c (v) c (vi) b (vii) b (viii) b (ix) b (x) a (xi) c (xii) a
(xiii) b (xiv) c (xv) b

Question 2

(i) 1. C 2. B 3. D 4. E 5. valency 2.

(ii) 1. 8 (octet) 2. bromine 3. acid salt 4. 44 g 5. electrovalent (ionic) bond.

(iii) 1 → Q, 2 → P, 3 → S, 4 → R, 5 → T.

(iv) 1. 100 2. increases 3. neutral 4. 1 (one) 5. transferred.

(v) 1. $3\text{Fe} + 4\text{H}_2\text{O} \rightarrow \text{Fe}_3\text{O}_4 + 4\text{H}_2$ 2. $\text{Na}_2\text{CO}_3 + 2\text{HCl} \rightarrow 2\text{NaCl} + \text{H}_2\text{O} + \text{CO}_2$ 3. 21.2% 4. 16 g
5. C with four shared pairs (to 4 H).

Section B (key points)

3. (b) $\text{Na} < \text{Mg} < \text{Si} < \text{Cl}$ (non-metallic character increases across a period). (c) size decreases and nuclear pull increases, so electrons are lost less easily. (d) Group VI, Period 3; valency 2; non-metal.

4. (b) Ca loses $2e^-$ to $\text{O} \rightarrow \text{Ca}^{2+} + \text{O}^{2-}$ (CaO). (c) ionic: high m.p., conduct when molten/aqueous, solids; covalent: low m.p., non-conductors, often liquids/gases.

5. (a) base = substance that neutralises an acid to give salt + water; salt = product of acid + base. (b) strong acid fully ionised (HCl); weak acid partly ionised (CH_3COOH). (c) CO_2 released with brisk effervescence. (d) NaCl by neutralisation/titration; PbSO_4 by precipitation (double decomposition).

6. (b) 21.2% (c) 4.4 g CO_2 ; 2.24 L at STP (d) CO_2 .

7. (a) increases; decreases. (b) MgCl_2 ionic, H_2O covalent. (c) alkali; acidic salt (e.g. NH_4Cl). (d) 5 L of O_2 . (e) $4\text{NH}_3 + \text{SO}_2 \rightarrow 4\text{NO} + 6\text{H}_2\text{O}$.