

CHEMISTRY ANSWER KEY

SSLC Exam 2025

1. Which of the given compounds is a mineral of Aluminium?

Answer: Cryolite

2. Which polymer is formed from isoprene?

Answer: Natural rubber (or Polyisoprene)

3. Find the total number of atoms in 2 GMM water (H₂O).

Answer:

- 1 molecule of H₂O contains 3 atoms (2 Hydrogen + 1 Oxygen)
- 2 GMM = $2 \times 6.022 \times 10^{23}$ molecules = 1.2044×10^{24} molecules
- Total atoms = $1.2044 \times 10^{24} \times 3 = 3.6132 \times 10^{24}$ atoms

4. Which is the product obtained when SO₃ gas is dissolved in concentrated sulphuric acid?

Answer: Oleum

5. Many of the metals in _____ block are used as catalysts in petroleum industry.

Answer: d-block

6. Classify the following compounds into alkanes, alkenes and alkynes:

Compounds: C₂H₄, C₅H₁₂, C₃H₈, C₇H₁₂

Answer:

- **Alkanes:** C₅H₁₂ (Pentane), C₃H₈ (Propane)
- **Alkenes:** C₂H₄ (Ethene)
- **Alkynes:** C₇H₁₂ (Heptyne)

7. Two gases Oxygen and Nitrogen at STP are given:

(a) Calculate the number of molecules in 64 g of Oxygen.

- Molecular mass of O₂ = 32
- Number of moles = $64 / 32 = 2$ moles
- Molecules = $2 \times 6.022 \times 10^{23} = 1.2044 \times 10^{24}$ molecules

(b) Calculate the mass of Nitrogen having the same volume as that of 64 g of Oxygen.

- 64 g of $O_2 = 2$ moles $= 2 \times 22.4$ L $= 44.8$ L (at STP)
- 44.8 L of $N_2 = 2$ moles (since 1 mole = 22.4 L)
- Mass of $N_2 = 2 \times 28 = 56$ g

8. **Two reactions related to extraction of metals are given. Identify calcination and roasting.**

(a) **Cu_2S ore is converted to Cu_2O by heating.**

This is **Roasting** (as it involves heating of sulphide ore in presence of oxygen).

(b) **Carbonates and hydroxides of metals decompose to form their oxides.**

This is **Calcination** (as it involves heating in absence of air).

9. **Identify A and B.**

(a) **$CH_3OH + CO \xrightarrow{\text{catalyst}} (A)$**

This forms **CH_3COOH (Acetic acid)**

$A = CH_3COOH$

(b) **$CHCl_3 + Cl_2 \rightarrow (B) + HCl$**

This forms **CCl_4 (Carbon tetrachloride)**

$B = CCl_4$

10. **The chemical formula of a compound is C_2H_6O .**

(a) **Write the structural formula of any one of the functional isomers.**

Two functional isomers:

Ethanol: CH_3-CH_2-OH

Dimethyl ether: CH_3-O-CH_3

(b) **Write the IUPAC name of this functional isomer.**

If ethanol: **Ethanol**

If dimethyl ether: **Methoxymethane**

11. **Copper is electroplated on an iron bangle.**

(a) **Which electrolyte is used here?**

Copper sulphate (CuSO₄) solution

(b) **Write any one of the advantages of electroplating.**

Improves appearance / Prevents corrosion / Increases durability

(c) **Does the intensity of colour of electrolyte change during this process? Why?**

Yes, the intensity decreases because **Cu²⁺ ions are deposited on the iron** and their concentration in the solution reduces.

12. **Subshell electronic configuration of element 'A' is given.**

(i) $1s^2 2s^2 2p^6 3s^2 3p^6 3d^2$

(ii) $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2$

(a) **Which is the correct subshell electronic configuration? Why?**

(ii) is correct

Because **4s orbital is filled before 3d orbital.**

(b) **Identify the block in the periodic table to which this element belongs.**

Ends in $4s^2 \rightarrow$ **s-block**

13. **Two reversible reactions are given:**

(I) $H_2(g) + I_2(g) \rightleftharpoons 2HI(g) + \text{Heat}$

(II) $2SO_2(g) + O_2(g) \rightleftharpoons 2SO_3(g) + \text{Heat}$

(a) **Identify the reaction in which pressure has no effect.**

Reaction I (equal number of moles of gas on both sides \rightarrow pressure has no effect)

(b) **How do the following factors influence the amount of product in Reaction II?**

(i) **Increase the temperature**

Decreases the amount of SO₃ (forward reaction is exothermic, heat opposes forward direction)

(ii) **Increase the pressure**
Increases the amount of SO_3 (forward reaction has fewer gas molecules)

14. (a) **Which types of reactions are these?**

(i) **Addition reaction**

(ii) **Polymerisation reaction**

(b) **Identify the product in the reaction (ii) and write any one use of it.**

Product: **Polyvinyl chloride (PVC)**

Use: **Used in making pipes, wires, cables, synthetic leather, etc.**

15. **Volume and number of molecules of gases at 27°C and 2 atm:**

Gas	Volume (L)	Number of molecules
Nitrogen	10	x
Carbon dioxide	(i) 20	2x
Oxygen	5	(ii) 0.5x

(a) **Complete the table.**

Use Avogadro's Law: Equal volumes of gases at same temp & pressure have equal number of molecules.

If 10 L = x molecules,

Then:

$\text{CO}_2 = 20 \text{ L} \rightarrow 2x \text{ molecules}$

$\text{O}_2 = 5 \text{ L} \rightarrow 0.5x \text{ molecules}$

(b) **What will be the volume of carbon dioxide gas if pressure is increased to 4 atm?**

At constant T and n, $P_1V_1 = P_2V_2$

$P_1 = 2 \text{ atm}$, $V_1 = 20 \text{ L}$

$P_2 = 4 \text{ atm}$

$V_2 = (P_1 \times V_1) / P_2 = (2 \times 20) / 4 = \mathbf{10 \text{ L}}$

16. **Manganese (Mn) is an element that belongs to d block in the periodic table.**

(a) Outer subshell electronic configuration of Mn is $3d^5 4s^2$. Find the atomic number of Manganese.

Answer: Atomic number = 25

(b) Find the oxidation state of Mn in Mn_2O_7 .

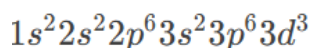
Answer: +7

(c) Write period number and group number of Manganese.

Answer: Period = 4, Group = 7

(d) Write the subshell electronic configuration of Mn^{4+} ion.

Answer:



17. A few drops of the solution 'X' is added to Magnesium sulphate solution taken in a test tube. A white precipitate is formed.

(a) What is 'X'?

Answer: Sodium hydroxide (NaOH)

(b) What is the chemical name of white precipitate formed here?

Answer: Magnesium hydroxide ($Mg(OH)_2$)

(c) What happens to the white precipitate when dilute hydrochloric acid is added?

Answer: It dissolves to form a clear solution.

(d) Which type of salt is identified by this experiment?

Answer: Magnesium sulphate ($MgSO_4$)

18. Three metals Ag, Mg, Cu and their salt solutions are given.

(a) How many galvanic cells can be constructed using these metals?

From 3 metals, possible pairs = $3C_2 = 3$ galvanic cells

(b) If we construct a galvanic cell using the most reactive metal and the least reactive metal from the given metals, identify the cathode and anode.

Reactivity order: **Mg > Cu > Ag**

Anode = Mg (most reactive → oxidized)

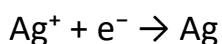
Cathode = Ag (least reactive → reduced)

(c) Write the chemical equation of the reaction which takes place at anode and cathode in the above cell.

At Anode (Mg):

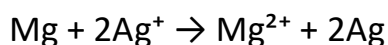


At Cathode (Ag):



(But since two electrons come from Mg, it would be: $2\text{Ag}^{+} + 2\text{e}^{-} \rightarrow 2\text{Ag}$)

Overall cell reaction:

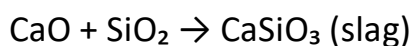


19. **(a) Write the name and chemical formula of ore of iron used in industrial production.**

Name: **Haematite**

Formula: **Fe₂O₃**

(b) Write the chemical equation of slag formation in the industrial production of iron.



(c) Which mineral of iron is known as fool's gold?

Iron pyrite or FeS₂

(d) Write the names of two alloy steels which contain the same constituent elements.

Stainless steel and **Tungsten steel** (both contain Fe, C, and other metals like Cr, W, etc.)

20.

A (Structure)	B (Molecular Formula)	C (Name)
1. CH ₃ -CH-CH-CH ₃ (CH ₃ on both C2 and C3)	C ₆ H ₁₄	2,3-Dimethylbutane
2. CH ₃ -CH=CH-CH ₃	C ₄ H ₈	But-2-ene
3. CH ₃ -CH(OH)-CH ₃	C ₃ H ₈ O	Propan-2-ol
4. CH ₃ -CH ₂ -CH ₂ -CH ₂ -COOH	C ₅ H ₁₀ O ₂	Pentanoic acid