

**ICSE Board**  
**Class X Chemistry**  
**Sample Paper – 1 Solution**

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**SECTION I**

**Answer 1****a.**

- i. Chromium oxide
- ii. Calcium sulphite
- iii. Calcium oxide or quick lime
- iv. Sulphur
- v. Galvanisation

**b.**

- i.  $\text{Zn} + \text{H}_2\text{SO}_4 \rightarrow \text{ZnSO}_4 + \text{H}_2$
- ii.  $\text{CuO} + \text{H}_2\text{SO}_4 \rightarrow \text{CuSO}_4 + \text{H}_2\text{O}$
- iii.  $\text{Na}_2\text{CO}_3 + \text{MgCl}_2 \rightarrow \text{MgCO}_3 + 2\text{NaCl}$
- iv.  $2\text{Fe} + 3\text{Cl}_2 \rightarrow 2\text{FeCl}_3$
- v.  $\text{Fe} + \text{S} \xrightarrow{\Delta} \text{FeS}$

**c.**

- i.  $\text{S} + 6\text{HNO}_3 (\text{conc.}) \rightarrow \text{H}_2\text{SO}_4 + 6\text{NO}_2 + 2\text{H}_2\text{O}$
- ii.  $\text{P}_4 + 20\text{HNO}_3 (\text{conc.}) \rightarrow 4\text{H}_3\text{PO}_4 + 20\text{NO}_2 + 4\text{H}_2\text{O}$
- iii.  $\text{Cu} + 4\text{HNO}_3 (\text{conc.}) \rightarrow \text{Cu}(\text{NO}_3)_2 + 2\text{H}_2\text{O} + 2\text{NO}_2$
- iv.  $\text{Zn} + 4\text{HNO}_3 (\text{conc.}) \rightarrow \text{Zn}(\text{NO}_3)_2 + 2\text{H}_2\text{O} + 2\text{NO}_2$
- v.  $\text{HNO}_3 (\text{conc.}) + 3\text{HCl} (\text{conc.}) \rightarrow \text{NOCl} + 2\text{H}_2\text{O} + 2[\text{Cl}]$

**d.**

1. (i) decreases    (ii) increases
2. (iii) decreases    (iv) increases
3. (v) decreases    (vi) increases
4. (vii) increases    (viii) decreases
5. (ix) increases    (x) decreases

**e.**

- i. First, the sugar turns brown, then it swells to give steam, and finally, it gets charred.
- ii. Dense white fumes are seen.
- iii. A colourless and odourless gas evolves with brisk effervescence which turns lime water milky.
- iv. On adding a little ammonium hydroxide, a white precipitate of zinc hydroxide is formed which dissolves in excess of ammonium hydroxide to give a clear solution.
- v. The solution becomes green.

f.

Cathode	Anode
(i) Lead metal	Bromine vapours
(ii) Hydrogen	Chlorine
(iii) Copper	Oxygen
(iv) Sodium	Chlorine
(v) Potassium	Chlorine

g.

- i. Sodium chloride – Ionic bonding
- ii. Carbon tetrachloride – Covalent bonding
- iii. Ammonia – Polar covalent bonding
- iv. Methane – Covalent bonding
- v. Calcium oxide – Ionic bonding

h.

- i. Hydrogen chloride gas is a polar covalent compound.
- ii. Ammonia turns moist red litmus blue.
- iii. Concentrated sulphuric acid is the least volatile acid.
- iv. Burning magnesium reacts with nitrogen to form magnesium nitride.
- v. Hydrogen chloride gas is highly or extremely soluble in water.

## SECTION II

### Answer 2

a.

i. (1) Silver (2) Copper spoon (3) Silver (4) Pure

ii. At the cathode:  $\text{Ag}^+ + \text{e}^- \longrightarrow \text{Ag}$

At the anode:  $\text{Ag} - \text{e}^- \longrightarrow \text{Ag}^+$

b.

i.  $\frac{10 \times 60}{100} = 6$  litres of propane

$\frac{10 \times 40}{100} = 4$  litres of butane

Now, 1 volume of propane = 3 volumes of  $\text{CO}_2$

6 litres of propane =  $\frac{3}{1} \times 6 = 18$  litres of  $\text{CO}_2$

2 volumes of butane = 8 volumes of  $\text{CO}_2$

4 litres of butane =  $\frac{8}{2} \times 4 = 16$  litres of  $\text{CO}_2$

Total volume of  $\text{CO}_2 = 18 + 16 = 34$  litres

ii. % of N =  $\frac{28}{80} \times 100 = 35\%$

% of O =  $\frac{48}{80} \times 100 = 60\%$

### Answer 3

a.

i. Lead sulphide

ii. Sulphur dioxide

iii. Liquefaction

iv. Calamine  $\text{ZnCO}_3$

b.

i. Minerals from which metals are extracted commercially at a comparatively low cost and with minimum effort are called ores.

ii. The earthy impurities, including silica and mud, associated with the ore are called gangue.

iii. A flux is a substance which is added to the charge in a furnace to remove the gangue.

c.

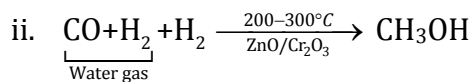
i. Baeyer's process

ii. Hall's process

iii. Hoopes process

**Answer 4**

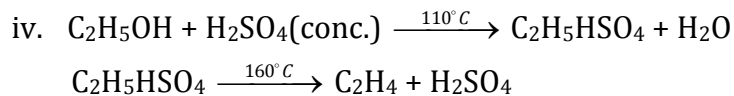
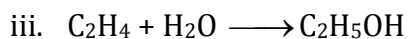
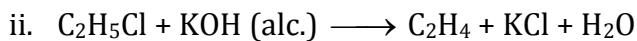
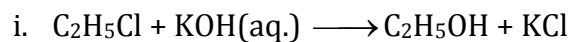
**a.**



iii.

iv.

**b.**



**c.**

i. Compounds with the same molecular formula but different structural formula are called isomers, and the phenomenon is called isomerism.

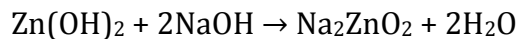
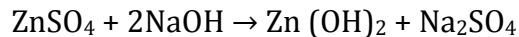
ii.

2-Methylpropane

**Answer 5**

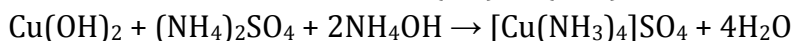
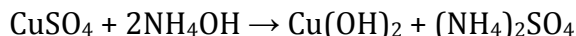
**a.**

- i. On adding sodium hydroxide to zinc sulphate drop by drop, a white precipitate is formed which is soluble in excess of sodium hydroxide.



(Soluble salt)

- ii. On adding  $\text{NH}_4\text{OH}$  drop by drop to a solution of copper sulphate, a pale blue ppt. appears which dissolves in excess of  $\text{NH}_4\text{OH}$  to give a deep blue or inky blue solution.



**b.**

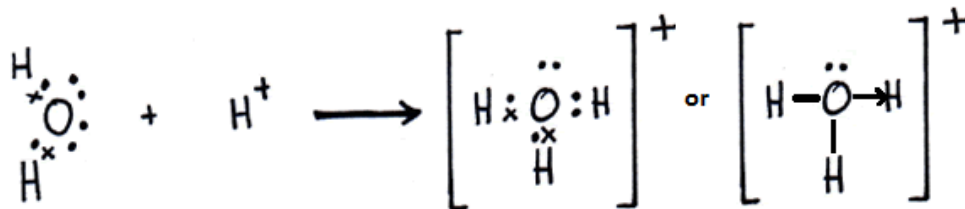
- The metal anode continuously dissolves as ions in solution; hence, it needs to be replaced periodically.
- The electrolyte dissociates into ions of the metal which migrate towards the cathode and are deposited as neutral metallic atoms on the cathode (article).
- Low current for a longer time initiates a smooth, firm, uniform and long-lasting deposition.
- AC causes discharge and ionisation to alternate at the cathode, thus giving no effective coating.

**Answer 6**

(a)

- (i) A lone pair of electrons: A pair of electrons which is not shared with any other atom is known as a lone pair of electrons. It is provided to the other atom for the formation of a coordinate bond.

- (ii) Electron dot diagram of hydronium ion:



Water

Hydrogen ion

Hydronium ion

(b)

- (i) The element B would have **lower** metallic character than A.
- (ii) The element A would probably have **higher** electron affinity than B.
- (iii) The element A would have **smaller** atomic size than B.

(c)

Conversion	Ionic Equation	Oxidation/Reduction
(i) Chloride ion to chlorine molecule	(i) $\text{Cl}^- - \text{e}^- \rightarrow \text{Cl}$ $\text{Cl} + \text{Cl} \rightarrow \text{Cl}_2$	(i) Oxidation
(ii) Lead (II) ion to lead	(ii) $\text{Pb}^{2+} + 2\text{e}^- \rightarrow \text{Pb}$	(ii) Reduction

### Answer 7

a.

- i.  $\text{Na}_2\text{SO}_3 + 2\text{HCl (dil.)} \rightarrow 2\text{NaCl} + \text{H}_2\text{O} + \text{SO}_2$   
 $\text{Cu} + 2\text{H}_2\text{SO}_4 \text{ (conc.)} \rightarrow \text{CuSO}_4 + 2\text{H}_2\text{O} + \text{SO}_2$
- ii. Sulphurous acid
- iii. Sulphites and bisulphites

b.

- i. Monobasic acid
- ii. Lead nitrate and silver nitrate
- iii. Hydrogen