IONIC EQUILIBRIUM

9.STRENGTH, PREPARATION AND PROPERTIES OF ACIDS & BASES

SOLUTIONS

TEACHING TASK

Single Answer Type

1. Which of the following is a weak acid?

A) H_3PO_4 B) H_2CO_3 C) HNO_2 D) All of these

Answer:D

Solution:H_3PO_4 — phosphoric acid, weak acid (triprotic but does not fully dissociate in water)

H_2CO_3 — carbonic acid, weak acid

HNO_2 — nitrous acid, weak acid

2. $NaHCO_3 + HCl \rightarrow .....+ CO_2 + H_2O$.

A)NaOH B)NaO C)NaCl D) Na

Answer:C

Solution: $Na_2CO_3 + 2HCl \rightarrow 2NaCl + CO_2 + H_2O$

3. Which acid do not change into their vapours, even on strong heating also.

(FA & SA- 5 Marks / 8 Marks)

A) H_2SO_4 B)HCl C) CH_3COOH D) HNO_3

Answer:A

Solution:

H_2SO_4 (Sulfuric acid) – It is non-volatile. Even on strong heating (unless extremely high temperature), it does not vaporize easily; instead, it may decompose at very high temperatures (~300°C and above) to give SO_3, but it doesn't boil like volatile acids.

HCl (Hydrochloric acid) – This is volatile; concentrated HCl solution releases HCl gas on mild heating.

CH_3COOH (Acetic acid) – Volatile; vaporizes easily upon heating (boiling point ~118°C).

HNO_3 (Nitric acid) – Volatile; boils and decomposes on heating.

The acid that does not change into vapour even on strong heating is H_2SO_4 because of its very low volatility and high boiling point (~337°C for pure acid; but when heated strongly, it decomposes rather than vaporizing intact).

4. $Al(OH)_3 + H_2SO_4 \rightarrow \ldots\ldots\ldots + \ldots\ldots\ldots$

A) AlH, H_2O B) $AlSO_4, SO_2$ C) $Al_2(SO_4)_3, H_2O$ D) none

Answer:C

Solution: $2Al(OH)_3 + 3H_2SO_4 \rightarrow Al_2(SO_4)_3 + 6H_2O$

5. Nitrogen pentoxide + water $\rightarrow$

A) Nitric acid B) Nitrous acid

C) Sulphurous acid D) Swaphuric acid

Answer:A

Solution: When nitrogen pentoxide (N_2O_5) reacts with water, it forms nitric acid (HNO_3).

$N_2O_5 + H_2O \rightarrow 2HNO_3$

6. $H_2 + \ldots\ldots\ldots ? \xrightarrow{Boiling} H_2S$

A) Cl B) SO_4 C) SO_3 D) S

Answer:D

Solution:Reaction: $H_2 + S \rightarrow H_2S$

Hydrogen gas reacts with sulfur to form hydrogen sulfide.

7. Metals displace hydrogen from the acids. They release.

A) H_2Gas B) O_2Gas C) SO_2Gas D) CO_2Gas

Answer:A

Solution:Metals reacting with acids typically produce hydrogen gas (H_2).

$Zn + 2HCl \rightarrow ZnCl_2 + H_2 \uparrow$

8. H_3BO_3 is in

A) Solid state B) Liquid state C) Gaseous state D) None

Answer:A

Solution:H_3BO_3 (boric acid) at room temperature and normal conditions is a solid (white crystalline powder).

9. $ZnO + 2HCl \xrightarrow{?} + H_2O$

A) $ZnCl_2$ B) ZnO C) Zn D) ZnCl

Answer:A

Solution: $ZnO + 2HCl \rightarrow ZnCl_2 + H_2O$

10. Which of the following acid is present in soft drinks ? **(FA & SA- 2 Marks)**

A) H_2SO_4 B) H_2NO_3 C) H_2CO_3 D) HNO_3

Answer:C

Solution:Soft drinks contain carbonic acid (H_2CO_3) due to dissolved CO_2 in water.

11. $KOH + CO_2 \rightarrow$

A) K_2CO_3+H_2O B) K_2O+C_2O+H_2O C) KO_2+H_2O D) K_2CO_3+H_2O+CO_2

Answer:A

Solution:Reaction of KOH with CO_2: $2KOH + CO_2 \rightarrow K_2CO_3 + H_2O$

12. When alkalis are warmed with Ammonium salts, they liberated .....

(FA & SA- 3 Marks / 4 Marks)

A) H_2Gas B) CO_2Gas C) NH_3Gas D) NH_4Gas

Answer:C

Solution:When an alkali (like NaOH or KOH) is heated with an ammonium salt (like NH_4Cl or $(NH_4)_2SO_4$), ammonia gas is liberated

13. $2NaOH + Zn \rightarrow .....+ H_2$.

A) $Zn(OH)_2$ B)NaO C) Na_2ZnO_2 D)none

Answer:C

Solution:Reaction: $2NaOH + Zn \rightarrow Na_2ZnO_2 + H_2$

Sodium zincate is Na_2ZnO_2

14. Bases are

A) Good conductors of electricity B) Bad conductors of electricity

C) Neutral D) Bad conductors of heat

Answer:A

Solution:Bases, when dissolved in water, dissociate into ions (e.g., OH?), making the solution a good conductor of electricity.

JEE ADVANCEDLEVEL

Multi Correct Choice Type:

15. Which of the following is true about acids ?

A) Acids are corrosive B) Acids taste sour

C) Soluble in water D) Turn Red to Blue

Answer:A,B,C

Solution:Properties of acids: Corrosive , Sour taste ,Soluble in water (acids we commonly refer to are soluble), Turn blue litmus red (not red to blue)

16. Which of the following acids are volatile ?

A) H_2SO_4 B) HCl C) HNO_3 D) H_2SO_{31}

Answer:B,C,D

Solution:Volatile acids vaporize easily at room temperature:

H_2SO_4 — nonvolatile

HCl — volatile

HNO_3 — volatile

H_2SO_3 — sulfurous acid, volatile

Statement Type :

17. **Statement-I :** Magnesium Hydroxide is used an antacid

Statement-II : It cures indigestion by neutralising excess acid in the stomach

Answer:A

Solution:Statement I: Magnesium hydroxide is used as an antacid — True.

Statement II: It cures indigestion by neutralizing excess acid in the stomach — True, and it explains Statement I.

18. **Statement-I :** Phosporous acid is a weak acid

Statement-II : They produces less concentration of H^+ ions in water.

Answer:A

Solution:Statement I: Phosphorous acid is a weak acid — True.
Statement II: They produce less concentration of H^+ ions in water — True, and this is the definition of a weak acid.

19. **Statement-I :** HNO_3 is a strong acid
Statement-II : H_2CO_3 is a strong acid

Answer:C

Solution:Statement I: HNO_3 is a strong acid — True.
Statement II: H_2CO_3 is a strong acid — False (H_2CO_3 is weak).

Comprehension type

An acid which contains hydrogen and a non-metallic element, other than oxygen is called Hydroacid.

20. Which of the following acid is Hydro acid
A) HCN B) HNO_2 C) H_2SO_4 D) H_2CO_3

Answer:A

Solution:A hydro acid is a binary acid composed of hydrogen and one other non-metal element (e.g., HCl, HF, H_2S).
Among the options:
HCN — hydrogen cyanide — binary compound of H and CN (pseudo-binary), often considered a hydro acid.
HNO_2 — nitrous acid — oxoacid (contains oxygen).
H_2SO_4 — sulfuric acid — oxoacid.
H_2CO_3 — carbonic acid — oxoacid.

21. An acid which contain hydrogen and non-metalic element other than oxygen .....
A) Volatile acid B) Non volatile acid
C) Hydro acid D) Oxy acid

Answer:C

Solution:An acid that contains hydrogen and a non-metallic element other than oxygen is called a hydro acid.
Examples: HCl, HBr, H_2S, HCN.

Integer Type :

22. Volatile acids easily charges into their vapours either at room temperature or heating below .....

Answer:100°C

Solution:Volatile acids change into vapor below 100°C (often at room temperature).

23. Hydro acids contain _____ type of elements.

Answer:2

Solution:Hydro acids contain 2 types of elements: hydrogen and a nonmetal (no oxygen).

Matrix Matching Type :

24. 1) $N_2O_5 + H_2O$ ( ) $A) H_3PO_3$
2) $N_2O_3 + H_2O$ ( ) $B) HNO_3$
3) $P_2O_3 + H_2O$ ( ) $C) H_3PO_4$
4) $P_2O_5 + H_2O$ ( ) $D) HNO_2$

Answer: 1-B,2-D,3-A,4-C

Solution:

1) $N_2O_5 + H_2O \rightarrow 2\ HNO_3$ B) HNO_3
2) $N_2O_3 + H_2O \rightarrow 2\ HNO_2$ D) HNO_2
3) $P_2O_3 + H_2O \rightarrow 2\ H_3PO_3$ A) H_3PO_3
4) $P_2O_5 + H_2O \rightarrow 2\ H_3PO_4$ C) H_3PO_4

LEARNER'S TASK

Conceptual Understanding Questions (CUQ's)

1. The acid which kills most of the germs then we swallow with food.
A) H_2SO_4 B) HCl C) HNO_3 D) H_2CO_3

Answer: B

Solution:The acid in our stomach is hydrochloric acid (HCl), which helps kill germs that may be present in the food we swallow.

2. $SO_2 + H_2O \rightarrow$
A) H_2SO_4 B) H_2SO_3 C) HSO_3 D) None

Answer:B

Solution:When sulfur dioxide dissolves in water, it forms sulfurous acid

$SO_2 + H_2O \rightarrow H_2SO_3$

3. H_2SO_4 is example for
A) strong acid B) Dibasic acid C) Non-volatile acid D) All the above

Answer:D

Solution:H_2SO_4 is:
A strong acid (fully dissociates in water for the first proton, strong for the second in dilute solutions).
A dibasic acid (has two replaceable H^+ ions).
A non-volatile acid (high boiling point, does not evaporate easily).

4. The acids in which more than 30% of the molecules of it ionise in water to furnish H^+ ions, are called_____.
A) Weak acids B) Strong acids
C) Neutral acids D) Inorganic acids

Answer:B

Solution:Acids that ionize more than 30% (or to a large extent) in water to produce H^+ ions are called strong acids.

5. Which of the following is a Hydro acid
A) HCl B) HNO_3 C) H_2SO_4 D) H_2CO_3

Answer:A

Solution: A hydro acid is a binary acid composed of hydrogen and one other nonmetal element, typically from the halogen group or sometimes sulfur, selenium, etc., but in simple terms it's a binary acid like HCl, HBr, HF, H_2S (but H_2S is sometimes called hydrosulfuric acid).
From the options:
HCl – Hydrochloric acid $\rightarrow$ Hydro acid (binary compound of H and Cl).
HNO_3 – Oxoacid (contains oxygen).
H_2SO_4 – Oxoacid.
H_2CO_3 – Oxoacid.

6. The acids which easily charges into their vapours is called
A) Volatile acids B) Non volatile acids
C) Strong acids D) Weak acids

Answer:A

Solution:Acids that easily turn into vapors upon heating are called volatile acids.

7. Color of HCl is
A) Colourless B) Brown C) Red D) Pink

Answer:A

Solution:Hydrogen chloride gas and its aqueous solution (hydrochloric acid) are both colourless.

8. $H_2 + Cl_2 \xrightarrow{?} 2HCl$
A) Heat B) Sunlight C) Catalyst D) None

Answer:B

Solution: Hydrogen and chlorine combine explosively in the presence of sunlight to form hydrogen chloride gas

9. $SO_3 + H_2O \longrightarrow$
A) H_2SO_3 B) H_2SO_4 C) H_2S D) H_2CO_3

Answer:B

Solution:Sulfur trioxide reacts with water to form sulphuric acid

$SO_3 + H_2O \rightarrow H_2SO_4$

10. Which of the following acid is heavier than water ?
A) Sulphuric acid B) Hydrochloric acid
C) Sulphurous acid D) Carbonic acid

Answer:A

Solution:Sulphuric acid (specific gravity ~ 1.84) is much heavier than water (specific gravity = 1)

11. The Number of hydroxyl ions (OH^-) furnished by one molecule of an alkali is called as
A) acidity B) Basicity C) Atomcity D) None

Answer:A

Solution:The number of hydroxyl ions (OH^-) furnished by one molecule of an alkali is called its acidity.

12. $NaOH + CO_2 \rightarrow ?$

A) Carbonate B) Bicarbonate C) Oxide D) none

Answer:A,B

Solution:The reaction between sodium hydroxide (NaOH) and carbon dioxide (CO_2) can produce either sodium carbonate or sodium bicarbonate, depending on the ratio of the reactants.

When there is a limited amount of carbon dioxide or an excess of sodium hydroxide, the product is sodium carbonate Na_2CO_3. This is an acid-base neutralization reaction, as carbon dioxide is an acidic oxide. The balanced chemical equation is: $2NaOH + CO_2 \rightarrow Na_2CO_3 + H_2O$

If there is an excess of carbon dioxide, it will react with the initially formed sodium carbonate and water to produce sodium bicarbonate $NaHCO_3$. The reaction is: $Na_2CO_3 + CO_2 + H_2O \rightarrow 2NaHCO_3$

This can also be written as a direct reaction with excess carbon dioxide: $NaOH + CO_2 \rightarrow NaHCO_3$

13. Bases in methyl orange solution turns

A) Brown B) Yellow C) Pink D) Blue

Answer:B

Solution:Bases turn methyl orange solution yellow.

14. $Ca(OH)_2 \xrightarrow{heat} ?$

A) CaO+H_2O B) Ca+H_2O C) CaOH+O_2 D) CaO_2+H_2O

Answer:A

Solution:When calcium hydroxide (slaked lime) is heated, it decomposes to form calcium oxide (quicklime) and water

$$Ca(OH)_2 \xrightarrow{heat} CaO + H_2O$$

15. Bases in prenolphthalin solution

A) Yellow B) Pink C) Brown D) Red

Answer:B

Solution:Bases turn phenolphthalein solution from colorless to pink.

JEE MAIN LEVEL

1. $Ca(OH)_2$+H_2SO_4 $\rightarrow$

A) $CaSO_4$ B) H_2O C) Both 1 and 2 D) CaO

Answer:C

Solution: $Ca(OH)_2 + H_2SO_4 \rightarrow CaSO_4 + 2H_2O$

2. Acid which is Brown due to impurities

A) H_2SO_4 B) HCl C) H_2CO_3 D) HNO_3

Answer:D

Solution:The acid that turns brown due to impurities is nitric acid HNO_3

3. Hydrogen gas is not evolved when ..... is mixed with Zinc.
A) Dil HNO_3 B) Conc HNO_3 C) Dil H_2SO_4 D) Conc H_2SO_4

Answer:A

Solution:When zinc reacts with dilute nitric acid, the nitric acid acts as a strong oxidizing agent, oxidizing the produced hydrogen to water, hence no hydrogen gas is released.

4. The acids which undergoes complete ionisation when dissolved in water and furnish large conc of H^+ ions are called.
A) Strong acids B) weak acids C) Volatile acids D) Non - Volatile acids

Answer: A

Solution:Acids that undergo complete ionization in water and produce a large concentration of H^+ ions are called strong acids.

5. Hydro chloric acid is also known as
A) muriatic acid B) Organic acid C) Non volatilve acid D) Weak acid

Answer:A

Solution:Hydrochloric acid (HCl) is commonly called muriatic acid, especially in industrial and cleaning applications

6. Chloric acid is a
A) Strong acid B) weak acid C) Non volatile acid D) Organic acid

Answer:A

Solution:Chloric acid ($HClO_3$) is a strong acid that ionizes almost completely in water to produce H^+ ions

7. Which of the following acid is a Hygroscopic in nature ?
(FA & SA- 3 Marks / 4 Marks)
A) H_2SO_4 B) HCl C) HNO_3 D) H_2CO_3

Answer: A

Solution:Hygroscopic substances are those that absorb moisture from the air.
Concentrated sulphuric acid (H_2SO_4) is highly hygroscopic and can even dehydrate organic substances due to its strong affinity for water.
Other options:
HCl $\rightarrow$ volatile, not strongly hygroscopic
HNO_3 $\rightarrow$ slightly hygroscopic, but less than H_2SO_4
H_2CO_3 $\rightarrow$ unstable in water, not hygroscopic

8. Which of the following highly corrosive mineral acid ?
A) H_2SO_4 B) HCl C) HNO_3 D) H_2CO_3

Answer: A

Solution:H_2SO_4 is very corrosive and can cause severe burns on contact with skin. It is a strong mineral acid used widely in industry

9. Another name of formic acid is **(FA & SA- 2 Marks)**
A) Ethanoic acid B) Methanoic acid C) Nitrous acid D) Oxalic acid

Answer: B

Solution:Formic acid has the chemical formula HCOOH, and according to IUPAC

nomenclature, it is called Methanoic acid

10. A metals will not react with dilute acids ?
A) Copper B) Silver C) Both 1 and 2 D) Zinc

Answer:C

Solution:Copper and silver are less reactive metals (below hydrogen in the reactivity series), so they do not displace hydrogen from dilute acids

11. Which of the following are correct statements
A) Bases conduct electricity in solution B) Alkalis bitter in taste
C) Bases Turns red litmus blue D) All the above.

Answer:D

Solution:All statements are true:
Bases conduct electricity in aqueous solution (due to ions).
Alkalis are bitter in taste.
Bases turn red litmus blue

12. Choose the false statements:
A) Na_2O is a common base. B) NaOH is a common base.
C) CuO is a common alkali. D) $Al(OH)_3$ is a common alkali.

Answer:C,D

Solution:$Na_2O \rightarrow$ base
NaOH $\rightarrow$ base
CuO $\rightarrow$ base but not alkali
$Al(OH)_3 \rightarrow$ amphoteric, not alkali

13 $3Fe + H_2O(steam) \xrightarrow{\Delta} ? + H_2 \uparrow$
A) FeO B) Fe_2O_3 C) Fe_3O_4 D) Fe

Answer:C

Solution: $3Fe + 4H_2O(steam) \xrightarrow{\Delta} \mathbf{Fe_3O_4} + 4H_2 \uparrow$

14. Ammonia gas dissolved in water produces
A) NH_4 B) NH_4OH C) NH_3 D) $NH_4(OH)_2$

Answer:B

Solution:Ammonia reacts with water to form ammonium hydroxide (NH_4OH)

$NH_3 + H_2O \rightleftharpoons NH_4OH$

15. Metal carbonates on strong heating produces **(FA & SA- 5 Marks / 8Marks)**
A) H_2 Gas B) CO_2Gas C) CO Gas D) N_2Gas

Answer:B

Solution: Metal carbonates decompose on strong heating to form metal oxides and carbon dioxide gas.

Metal carbonate $\xrightarrow{heat}$ Metal oxide+CO_2

Examples:
$CaCO_3 \rightarrow CaO + CO_2$
$MgCO_3 \rightarrow MgO + CO_2$
Concept: Thermal decomposition of carbonates always releases CO_2 gas

16. $K_2O + H_2O \rightarrow$?

A) KOH B) K_2O C) $K+O_2$ D) $K(OH)_2$

Answer:A

Soltion:The reaction of potassium oxide (K_2O) with water (H_2O) is a characteristic reaction of a basic metal oxide with water, which produces a metal hydroxide

$$K_2O + H_2O \rightarrow 2KOH$$

The product is Potassium Hydroxide (KOH).

17. Which of the following metals produces hydrogen gas on steam ?

A) Na B) Ca C) Mg D) Cu

Answer:C

Solution:Magnesium reacts with steam to form magnesium oxide (MgO) and hydrogen gas (H_2).

$$Mg + H_2O(steam) \xrightarrow{\Delta} MgO + H_2$$

Sodium (Na) and calcium (Ca) react with cold water, not steam.
Copper (Cu) does not react with water or steam

JEE ADVANCED LEVEL

Multi Correct answer type

18. Which of the following are strong acids ?

A) Chloric acid B) Per chloric acid
C) Hydronic acid D) Hydro iodic acid

Answer:A,B,D

Solution:$HClO_3$, $HClO_4$, and HI are strong acids — they ionize almost completely in water.

19. Which of the following are weak acids ?

A) Oxalic acid B) Formic acid C) Benzoic acid D) Hydroic acid

Answer:A,B,C

Solution:1) Oxalic acid ($H_2C_2O_4$): Weak Acid (Yes, it's a weak dicarboxylic acid)

2) Formic acid (HCOOH): Weak Acid (Yes, it's a weak carboxylic acid)

3) Benzoic acid (C_6H_5COOH): Weak Acid (Yes, it's a weak carboxylic acid)

20. Which of the following is a Diacidic Alkali/Base

A) $Ca(OH)_2$ B) $Mg(OH)_2$ C) $Cu(OH)_2$ D) $Fe(OH)_3$

Answer:A,B,C

Solution:A base (or alkali) is classified by its acidity (also called basicity) based on the number of hydroxyl (OH^-) ions it can produce per molecule in an aqueous solution. A Diacidic base produces two (OH^-) ions per molecule.

1) $Ca(OH)_2 (Calcium Hydroxide) : Dissociates to Ca^{2+} + \mathbf{2}OH^- . Diacidic Base$

2) $Mg(OH)_2 (Magnesium Hydroxide) : Dissociates to Mg^{2+} + \mathbf{2}OH^- . Diacidic Base$

3) $Cu(OH)_2 (Copper(II) Hydroxide) : Dissociates to Cu^{2+} + \mathbf{2}OH^- . Diacidic Base$

4) $Fe(OH)_3 (Iron(III) Hydroxide) : Dissociates to Fe^{3+} + \mathbf{3}OH^- . This is a Triacidic Base$

Statement Type :

A) Both the statements ar **TRUE** and **Statement -II** is the correct explanation of **STATEMENT -** I

B) Both the statements are **TRUE** and **Statement -II** is not the correct explantion of Statement -I

C) Statement -I is **TRUE** and Statement -II is **FALSE**

D) Statement -Iis **FALSE** and Statement -II is **TRUE**

21. **Statement -I :** $2HCl + CuCO_3 \rightarrow CuCl_2 + H_2O + CO_2$

Statement -II : Green solid dissolves with effervescence to form blue solution.

Answer:A

Solution:Both statements are TRUE, and Statement-II correctly explains Statement-I — effervescence is due to CO_2 gas, and the blue solution is due to $CuCl_2$

22. **Statement -I :** Acids reacts with bases to form salts and water.

Statement -II : When Hydrochloric acid reacts with Iron (III) oxide forms Reddish - Brown Crystals.

Answer:B

Solution:Statement-I: Acids react with bases to form salts and water.Analysis: This is the definition of a neutralization reaction. (TRUE)

Statement-II: When Hydrochloric acid reacts with Iron (III) oxide forms Reddish - Brown Crystals.Analysis: The reaction is: $Fe_2O_3(s) + 6HCl(aq) \rightarrow 2FeCl_3(aq) + 3H_2O(l)$.

Iron(III) oxide is an amphoteric/basic oxide that reacts with acid. Iron(III) chloride ($FeCl_3$) is a yellowish-brown/reddish-brown solid salt that can form crystals upon evaporation. (TRUE)

23. **Statement -I :** The oxides of metals are commonly called basic oxides.

Statement -II : The basic oxides react with acids to form salt and water as only products.

Answer:A

Solution: Both are TRUE, and Statement-II correctly explains Statement-I

24. Carbonate metal which will not decompose on strong heating also.

A) K_2CO_3 B) $CaCO_3$ C) $ZnCO_3$ D) $CuCO_3$

Answer:A

Solution:

Among carbonates —

Na_2CO_3 and K_2CO_3 (alkali metal carbonates) do not decompose even on strong heating.

$CaCO_3$, $ZnCO_3$, $CuCO_3$ all decompose on heating to give metal oxide + CO_2

25. $ZnCO_3 \xrightarrow{heat} ? + ?$

A) ZnO, CO_2 B) Zn,CO_2 C) $ZnCO_2$,O_2 D) Zn,O_2

Answer:A

Solution:On heating, zinc carbonate decomposes to give zinc oxide and carbon dioxide

$ZnCO_3 \overset{heat}{\rightarrow} ZnO + CO_2$

Integer Type :

26. Di acidic base contain ..... number of Hydroxyl ions to react with one molecule acid.

Answer:2

Solution:A diacidic base can donate two hydroxyl (OH^-) ions.

It can react with one molecule of dibasic acid completely

27. ..... $Na + 2H_2O \rightarrow 2NaOH + H_2\uparrow$

Answer:2

Solution: $2Na + 2H_2O \rightarrow 2NaOH + H_2\uparrow$

Matrix Matching Type :

28. **Column-I** **Column-I**

1) $NaOH + H_2SO_4$	( )	$A) ZnCl_2 + H_2O$
2) $ZnO + HCl$	( )	$B) ZnCl_2 + CO_2 + H_2O$
3) $ZnCO_3 + HCl$	( )	$C) Na_2SO_4 + 2H_2O$
4) $Zn + HCl$	( )	$D) ZnCl_2 + H_2$

Answer: 1-C,2-A,3-B,4-D

Solution:

1. $NaOH + H_2SO_4$ C) $Na_2SO_4 + 2H_2O$
2. $ZnO + HCl$ A) $ZnCl_2 + H_2O$
3. $ZnCO_3 + HCl$ B) $ZnCl_2 + CO_2 + H_2O$
4. $Zn + HCl$ D) $ZnCl_2 + H_2$

KEY

				TEACHING TASK					
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
D	C	A	C	A	D	A	A	A	C
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
A	**C**	C	**A**	A,B,C	B,C,D	A	A	C	**A**
21	**22**	**23**	**24**						
C	100	2	1-B,2-D,3-A,4-C						
				LEARNER'S TASK					
			CONCEPTUAL UNDERSTANDING QUESTIONS(CUQ'S)						
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
B	B	D	B	A	A	A	B	B	A
11	**12**	**13**	**14**	**15**					
A	A,B	B	A	B					
			JEE MAINS & ADVANCED LEVEL QUESTIONS						
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
C	D	A	**A**	A	A	A	A	B	C
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
D	C,D	C	**B**	B	A	C	A,B,D	A,B,C	A,B,C
21	**22**	**23**	**24**	**25**	**26**	**27**	**28**		
A	B	A	A	A	2	2	1-C,2-A,3-B,4-D		