11. PREPARATION, PROPERTIES & USES OF BASES / ALKALI

SOLUTIONS

TEACHING TASK

JEE MAINS LEVEL QUESTIONS

1. Chemical name of bleaching powder is. **(FA & SA- 2 Marks)**

A) $CaCl_2$ B)NaCl C) Na_2CO_3 D) $CaOCl_2$

Answer:D

Solution:Chemical name of bleaching powder is $CaOCl_2$ (Calcium oxy chloride)

2. $Ca(OH)_2 + Cl_2 \rightarrow .....+ H_2O$.

A)$CaOCl_2$ B)$CaCl_2$ C)CaO D)Ca

Answer:A

Solution:This is the reaction for the formation of bleaching powder:

$$Ca(OH)_2 + Cl_2 \rightarrow CaOCl_2 + H_2O$$

3. An alkali solution having reletively less percentage of alkali in its aqeous solution is called

A) Dilute alkali B) Concentrated alkali

C) both A & B D) None

Answer:A

Solution:An alkali solution with a relatively low percentage of alkali in its aqueous solution is referred to as a dilute alkali. This indicates that a small amount of alkali is dissolved in a larger amount of water, resulting in a lower concentration.

4. All properties of alkalis are due to the presence of the _____ formed on dissociation of the alkali in water **(FA & SA- 3 Marks / 4 Marks)**

A) H^+ ions B) H_2O^+ ions C) H^+ ions D) OH^- ions

Answer:D

Solution:The properties of alkalis, such as their ability to turn red litmus blue, feel slippery, and neutralize acids, are due to the presence of hydroxide ions (OH^-) formed when the alkali dissociates in water. For example, sodium hydroxide (NaOH) dissociates as $NaOH \rightarrow Na^+ + OH^-$.

5. What is the product formed when potassium oxide reacts with water?

A) NaOH B) Na_2O C) $Ca(OH)_2$ D) KOH

Answer:D

Solution:When potassium oxide (K_2O) reacts with water (H_2O), it forms potassium

hydroxide (KOH). The balanced chemical equation for this reaction is:

$$K_2O + H_2O \rightarrow 2KOH$$

6. Which of the following are alkali substances

A) NaOH B) KOH C) $Al(OH)_3$ D) All

Answer:A,B

Solution:NaOH (Sodium hydroxide) and KOH (Potassium hydroxide) are considered alkalis because they are soluble in water and produce hydroxide ions (OH-) when dissolved.

$Al(OH)_3$ (Aluminum hydroxide) is not considered an alkali because it is in soluble in water. While it is a base, alkalis are a subset of bases that are water-soluble.

7. From the following which is the mono basic acid .

A)sulphuric acid B)acetic acid C)phosphoric acid D)all

Answer:B

Solution:A mono basic acid is an acid that can donate only one proton (H^+ ion) per molecule in an aqueous solution. Among the given options:

Sulphuric acid (H_2SO^4) is dibasic, as it can donate two protons.

Acetic acid (CH_3COOH) is mono basic, as it donates only one proton.

Phosphoric acid (H_3PO_4) is tribasic, as it can donate three protons.

8. From the following which is the strong base. **(FA & SA- 5 Marks / 8 Marks)**

A) $Ca(OH)_2$ B)KOH C) NH_4OH D) $Mg(OH)_2$

Answer:B

Solution:Strong bases are those that completely dissociate in water to give a high concentration of OH^- ions.

Weak bases only partially dissociate.

Comparison:

KOH — Strong base (completely ionizes in water).

$Ca(OH)_2$ — Strong, but slightly less soluble; still considered strong base.

NH_4OH — Weak base (partially ionizes).

$Mg(OH)_2$ — Sparingly soluble, weak base.

Among these, KOH is the strongest because it is highly soluble and completely dissociate

JEE ADVANCED LEVEL QUESTIONS

Multi Correct Choice Type:

11. Which of the following is/are bases/s?

A) Magnesium oxide B) Copper oxide

C) Aluminium hydroxide D) Sodium oxide

Answer:A,B,C,D

Solution:A) Magnesium oxide (MgO)

Reacts with acids to form salt and water → Basic oxide

B) Copper oxide (CuO)

Reacts with acids to form salt and water → Basic oxide

C) Aluminium hydroxide ($Al(OH)_3$)

Amphoteric (can act as both acid and base), but generally considered a base in many contexts, especially in neutralization reactions with acids

D) Sodium oxide (Na_2O)

Reacts with water to give NaOH (strong base) → Basic oxide

All of these can act as bases in acid–base reactions.

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**

12. **Statement I** : All oxides and hydroxides of metals are bases.
Statement II : The substances which react with acids to form salt and water as only products are called bases.

Answer:D

Solution:Statement I: All oxides and hydroxides of metals are bases.

This is false because some metal oxides/hydroxides are amphoteric (e.g., Al_2O_3, ZnO, $Al(OH)_3$, $Zn(OH)_2$) and some are acidic (e.g., CrO_3, Mn_2O_7).

Statement II: The substances which react with acids to form salt and water as only products are called bases.

This is true — it's the standard Bronsted-Lowry / Arrhenius definition of a base in a neutralization reaction.

13. **Statement I** : The oxides and hydroxides of sodium and potassium are strong bases.
Statement II : Sodium hydroxide and potassium hydroxide are not soluble in water

Answer:C

Solution:Statement I: The oxides and hydroxides of sodium and potassium are strong bases.

True — NaOH and KOH are strong bases; Na2O and K2O form strong bases in water.

Statement II: Sodium hydroxide and potassium hydroxide are not soluble in water.

False — they are highly soluble in water.

Comprehension type

The substances which react with acids to form salt and water as the only products are called bases.

14. Ammonia liquor is

A) Ammonia chloride B) Ammonium bicarbonate
C) Ammonium carbonate D) Ammonium hydroxide

Answer:D

Solution:"Ammonia liquor" generally means an aqueous solution of ammonia, which forms ammonium hydroxide (NH_4OH) in water.

15. What is the product formed when potassium oxide racts with water?

A) KOH B) K_2O C) $Ca(OH)_2$ D) $Ca(OH)_3$

Answer:A

Solution:Potassium oxide (K_2O) reacts with water: $K_2O + H_2O \rightarrow 2KOH$

Integer Type :

16. The number of Hydroxyl ions (OH^-) furnished by ..... molecule of an Akali on complete dissociation in water is called acidity of base.

Answer:1

Solution:Acidity of a base = the number of OH^- ions furnished by one molecule of a base on complete dissociation in water.

17. Alkalies classified into ..... types based on strength.

Answer:2

Solution:Based on strength: Strong alkali and Weak alkali $\rightarrow$ 2 types.

Matrix Matching Type :

18.

Column-I	**Column-II**
a) KOH	A) Monoacidic base
b) NH_4OH	B) Strongalkali
c) NaOH	C) Diacidic base
d) $Ca(OH)_2$	D) Weak alkali
	5)Tartaric acid

Answer:a-A,B,b-A,D,c-A,B,d-C

Solution:

a) KOH	B) Strongalkali A) Monoacidic base
b) NH_4OH	D) Weak alkali A) Monoacidic base
c) NaOH	B) Strongalkali A) Monoacidic base
d) $Ca(OH)_2$	C) Diacidic base

LEARNERS TASK

CONCEPTUAL UNDERSTANDING QUESTIONS(CQU'S)

1. NaoH is an example for
   A) Strong Base B) Mono acidic alkali
   C) Weak acid D) A and B only.

Answer:D

Solution:NaOH is a strong base and also a mono acidic alkali (one OH? per molecule).

2. Which of the following is used as 'antacid'
   A) Calcium hydroxide B) Magnesium hydroxide
   C) Sodium hydroxide D) None

Answer:B

Solution:Magnesium hydroxide is commonly used as an antacid to neutralize excess stomach acid. It is the active ingredient in products like milk of magnesia.

3. Formula of slaked lime
   A) $Mg(OH)_2$ B) $Ca(OH)_2$ C) NaOH D) CaO.

Answer:B

Solution:Slaked lime is $Ca(OH)_2$.

4. 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 produced by one molecule of an alkali on complete dissociation is called as acidity of Bases.

5. 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:A) Bases conduct electricity in solution — True (ions present).
B) Alkalis bitter in taste — True.
C) Bases turn red litmus blue — True.

6. 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:C) CuO is a common alkali. D) $Al(OH)_3$ is a common alkali. — Both are false

(CuO is a basic oxide but not an alkali; $Al(OH)_3$ is amphoteric).

7. Acid used in the stain remover ?
A) Oxalic acid B) Boric acid C) Phosphoric acidD) Sulphuric acid

Answer:A

Solution: Oxalic acid is commonly used in stain removers due to its ability to break down and remove certain types of stains, such as rust, ink, and tannin stains. It acts as a reducing agent and is effective in cleaning fabrics and surfaces.

8. LiOH is a
A) Mono basic B) Dibasic C) Tribasic D) None

Answer:A

Solution:LiOH provides one OH? per formula unit.

9. Which of the following is strong Alkali ?
A) KOH B) NH_4OH C) $Ca(OH)_2$ D) $Mg(OH)_2$

Answer:A

Solution:Strong alkalis, like KOH (potassium hydroxide) and NaOH (sodium hydroxide), completely dissociate in water, releasing a large amount of hydroxide ions (OH^-).

10. $3Fe + H_2O(steam) \xrightarrow{\Delta} ? + H_2 \uparrow$
A) FeO B) Fe_2O_3 C) Fe_3O_4 D) Fe

Answer:C

Solution: $3Fe + 4H_2O\ (steam) \rightarrow Fe_3O_4 + 4H_2$

JEE MAINS LEVEL QUESTIONS

1. Acid is used in the washing eyes ?
A) Oxalic acid B) Citric acid C) Acetic acid D) Boric acid

Answer:D

Solution:Boric acid is commonly used in eye washes due to its mild antiseptic properties.

2. Acid used in the De-scaling process ? **(FA & SA- 3 Marks / 4 Marks)**
A) dil. HCl B) dil.H_2SO_4 C) H_2CO_3 D) HNO_3

Answer:A

Solution:Dilute hydrochloric acid (HCl) is often used for de-scaling, as it effectively dissolves mineral deposits.

3. An Alkali solution having a relatively high percentage of alkali in its aqueous solution is called
A) Strong alkali B) Weak alkali C) Concentrated alkali D) Dilute alkali

Answer:C

Solution:A solution with a high percentage of alkali is referred to as concentrated.

4. Which of the following is a Triacidic Base ? **(FA & SA- 5 Marks / 8 Marks)**
A) $Fe(OH)_3$ B) $Cu(OH)_2$ C) H_3PO_4 D) H_2SO_4

Answer:A

Solution:A triacidic base furnishes three hydroxide ions (OH^-). $Fe(OH)_3$ (iron(III) hydroxide) is triacidic.

5. $4K+O_2 \rightarrow$ .....

A) K_2O B) $2K_2O$ C) $3K_2O$ D) 2KO

Answer:B

Solution:The balanced equation for potassium reacting with oxygen is

$$4K + O_2 \rightarrow 2K_2O.$$

6. Ammonia gas dissolved in water produces

A) NH_4 B) NH_4OH C) NH_3 D) $NH_4(OH)_2$

Answer:B

Solution:Ammonia (NH_3) dissolves in water to form ammonium hydroxide (NH_4OH).

7. Metal carbonates on strong heating produces

A) H_2 Gas B) CO_2Gas C) CO Gas D) N_2Gas

Answer:B

Solution:Metal carbonates decompose upon heating to produce carbon dioxide gas.

8. $K_2O + H_2O \rightarrow$?

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

Answer:A

Solution:The reaction between potassium oxide (K_2O) and water (H_2O) produces potassium hydroxide (KOH). The balanced chemical equation is:

$$K_2O + H_2O \rightarrow 2KOH$$

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

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

Answer:C

Solution:Magnesium (Mg) reacts with steam to produce hydrogen gas.

10. All metal oxides are **(FA & SA- 2 Marks)**

A) Alkalies B) Bases C) Acids D) Salts

Answer:B

Solution:Metal oxides are generally basic in nature.

JEE ADVANCED LEVEL QUESTIONS

Multi Correct Answer Type

11. 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 diacidic base (or dibasic base) furnishes 2 OH^- ions per molecule on complete dissociation.

A) $Ca(OH)_2 \rightarrow 2\ OH^-$ ions $\rightarrow$ diacidic base

B) $Mg(OH)_2 \rightarrow 2\ OH^-$ ions $\rightarrow$ diacidic base
C) $Cu(OH)_2 \rightarrow 2\ OH^-$ ions $\rightarrow$ diacidic base
D) $Fe(OH)_3 \rightarrow 3\ OH^-$ ions $\rightarrow$ triacidic base

12. Sulphuric acid used in the
A) Used in the batteries B) Used in the fertilizers
C) Used in the dyes D) Used in the De - scaling

Answer:A,B,C,D

Solution:Sulphuric acid (H_2SO_4) is widely used in:
A) Batteries (lead–acid battery)
B) Fertilizers (for making ammonium sulphate, superphosphate)
C) Dyes (used in chemical processing of dyes)
D) De-scaling (used for removing rust and scale)

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**

13. **Statement I** **:** The oxides and hydroxides of all metals are weak bases.
Statement II **:** Ammonium hydroxide obtained by dissolving ammonia gas in water is a weak base.

Answer:D

Solution: Statement I: The oxides and hydroxides of all metals are weak bases.
False — Some metal oxides/hydroxides are strong bases (e.g., NaOH, KOH).
Statement II: Ammonium hydroxide obtained by dissolving ammonia gas in water is a weak base.
True — NH_4OH is a weak base (partial dissociation).

14. **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: Statement I: The oxides of metals are commonly called basic oxides.
True in general (most metal oxides are basic, except amphoteric/acidic ones, but "commonly called" is acceptable).
Statement II: The basic oxides react with acids to form salt and water as only products.
True — definition of basic oxide.
Also, Statement II correctly explains why they are called basic oxides.

Comprehension type :

All carbonate metals (except Na_2CO_3, K_2CO_3) on heating strongly decompose to form their respective metallic oxides and carbon dioxide gas.

15. 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:Thermal stability of metal carbonates increases down the reactivity series (for Group 1 metals, the carbonates are very stable).
Na_2CO_3 and K_2CO_3 → do not decompose on strong heating.
$CaCO_3$, $ZnCO_3$, $CuCO_3$ → decompose to metal oxides + CO_2

16. $ZnCO_3 \xrightarrow{heat} ? + ?$
A) ZnO, CO_2 B) Zn,CO_2 C) $ZnCO_2$,O_2 D) Zn,O_2

Answer:A

Solution: $ZnCO_3 \xrightarrow{heat} ZnO + CO$

Integer Type :

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

Answer:2

Solution:A diacidic (dibasic) base has 2 hydroxyl (OH^-) ions per molecule — it can neutralize 2 H^- ions from an acid.

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

Answer:2

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

Each 2 Na atoms react with 2 H_2O molecules to form 2 NaOH + H_2

Matrix Matching Type :

19.

Column-I	**Column-I**
a) $4Na + O_2$	A) 2NaOH
b) $2Mg + O_2$	B) 2 KOH
c) $Na_2O + H_2O$	C) $2Na_2O$
d) $K_2O + H_2O$	D) 2MgO
	5) 2NaO

Answer:a–C, b–D, c–A, d–B

Solution:

a) $4Na + O_2$	C) $2Na_2O$
b) $2Mg + O_2$	D) 2MgO
c) $Na_2O + H_2O$	A) 2NaOH
d) $K_2O + H_2O$	B) 2 KOH

KEY

				TEACHING TASK					
			JEE MAINS LEVEL QUESTIONS						
1	2	3	4	5	6	7	8		
D	A	A	D	D	A,B	B	B		
			JEE ADVANCED LEVEL QUESTIONS						
11	12	13	14	15	16	17	18		
A,B,C,D	D	C	D	A	1	2	a-A,B,b-A,D,c-A,B,d-C		
				LEARNERS TASK					
			CONCEPTUAL UNDERSTANDING QUESTIONS(CQU'S)						
1	2	3	4	5	6	7	8	9	10
D	B	B	A	D	C,D	A	A	A	C
			JEE MAINS LEVEL QUESTIONS						
1	2	3	4	5	6	7	8	9	10
D	A	C	A	B	B	B	A	C	B
			JEE ADVANCED LEVEL QUESTIONS						
11	12	13	14	15	16	17	18	19	
A,B,C	A,B,C,D	D	A	A	A	2	2	a–C, b–D, c–A, d–B	

WORKSHEET BASED ALKALI / BASE PROPERTIES & USES

TEACHING TASK

JEE MAINS LEVEL QUESTIONS

Single Answer Type

1. $2NaOH + Zn \rightarrow .....+ H_2$. **(FA & SA- 2 Marks)**

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

Answer:C

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

2. Calcium hydroxide is used in the manfacture of .
   A)plaster of paries B)bleaching powder
   C)soap D)synthetic fibre

Answer:B

Solution:Calcium hydroxide is used in the manufacture of bleaching powder.

3. Bases are
   A) Good conductors of electricity B) Bad conductors of electricity
   C) Neutral D) Bad conductors of heat

Answer:A

Solution:When dissolved in water, bases dissociate into ions, which can carry an electric current, making them good conductors.

4. Bases turns red litmus to
   A) Red B) Blue C) Pink D) Yellow

Answer:B

Solution:Bases turn red litmus to Blue.

5. Alkalies are
   A) Sour taste B) Bitter taste C) Sweet taste D) Spicy taste

Answer:B

Solution:Alkalies are Bitter taste.

6. Bases reacts with acids to form **(FA & SA- 3Marks/4 Marks)**
   A) Salts B) Oxides C) Hydroxides D) Non-metallic oxides

Answer:A

Solution:Bases react with acids to form Salts and water.

7. Slaked lime is a
   A) Calcium Hydroxide B) Potassium Hydroxide
   C) Sodium Hydroxide D) Lithium Hydroxide

Answer:A

Solution:Slaked lime is Calcium Hydroxide.

8. A Base used in the synthesis of "Rayan" ? **(FA & SA- 5 Marks/8 Marks)**
A) KOH B) NaOH C) $Ca(OH)_2$ D) $Mg(OH)_2$

Answer:B

Solution:NaOH (used in viscose process).

9. $KOH + CO_2 \rightarrow$
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: $2KOH + CO_2 \rightarrow K_2CO_3 + H_2O$

10. When alkalis are warmed with Ammonium salts, they liberated .....
A) H_2Gas B) CO_2Gas C) NH_3Gas D) NH_4Gas

Answer:C

Solution: When alkalis are warmed with ammonium salts, they liberate NH_3 Gas.

JEE ADVANCED LEVEL QUESTIONS

Multi Correct Choice Type:

11. NaOH used in the
A) Manufacture of soap
B) Manufacture of paper
C) Manufacture of Bleaching powder
D) Cure indigestion

Answer:A,B

Solution:NaOH (Sodium hydroxide) is a strong alkali used in:
Soap making (saponification)
Paper industry (pulping process)
It is not used in making bleaching powder (that uses $Ca(OH)_2$ and Cl_2).
It is not used to cure indigestion (that uses weak bases like $Mg(OH)_2$)

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**

12. **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 neutralizes excess hydrochloric acid in the stomach to cure indigestion — True and correctly explains Statement I

Comprehension type:

Sodium hydroxide is a base .Formula is NaOH and commomnly called caustic soda.

13. Caustic soda is

A) NaOH B) KOH C) NH_4OH D) $Ca(OH)_2$

Answer:A

Solution:"Caustic soda" is the common name for Sodium Hydroxide (NaOH).

14. Caustic soda used in

A) Used to make soap B) Used to make paper

C) Drain pipe cleaner D) All

Answer:D

Solution:Caustic soda is

Used to make soap

Used to make paper

Drain pipe cleaner (dissolves organic blockages)

Matrix Matching Type :

15. a) Slaked line A) $Mg(OH)_2$

b) Baking soda B) $NaHCO_3$

c) Washing soda C) $Ca(OH)_2$

d) Milk of magnesia D) Na_2CO_3

Answer:a–C, b–B, c–D, d–A

Solution:

a) Slaked line C) $Ca(OH)_2$

b) Baking soda B) $NaHCO_3$

c) Washing soda D) Na_2CO_3

d) Milk of magnesia A) $Mg(OH)_2$

LEARNERS TASK

JEE MAINS LEVEL QUESTIONS

1. $2Al(OH)_3 \xrightarrow{\Delta}$

A) $Al_2O_3+H_2O$ B) Al_2+O_2 C) AlO_3+H_2O D) $AlO+O_2$

Answer:A

Solution:Decomposes to aluminum oxide and water: $2Al(OH)_3 \rightarrow Al_2O_3 + 3H_2O$

2. $NaOH + CO_2 \rightarrow ?$ **(FA & SA- 5 Marks/8 Marks)**

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

Answer:A,B

Solution:The reaction product of $NaOH+CO_2$ is primarily sodium carbonate Na_2CO_3 when there is sufficient sodium hydroxide present. The balanced equation for this reaction is: $2NaOH + CO_2 \rightarrow Na_2CO_3 + H_2O$

If carbon dioxide is in excess or the NaOHsolution is very dilute, sodium bicarbonate $NaHCO_3$ can be formed: $NaOH + CO_2 \rightarrow NaHCO_3$

3. Bleaching powder prepared from
A) $Ca(OH)_2$ B) NaOH C) KOH D) NH_4OH

Answer:A

Solution:Bleaching powder prepared from $Ca(OH)_2$ with Cl_2

4. Acids reacts bases forms
A) Salts B) Carbonates C) Oxides D) Hydroxides

Answer:A

Solution:Acids react with bases to form Salts and water.

5. Bases in methyl orange solution turns **(FA & SA- 2 Marks)**
A) Brown B) Yellow C) Pink D) Blue

Answer:B

Solution:Bases in methyl orange solution turn Yellow.

6. $Al(OH)_3 + H_2SO_4 \rightarrow ?$
A) $Al_2(SO_4)_3+H_2O$ B) $Al_3(SO_4)_2+H_2O$ C) $Al_2O_3+H_2O$ D) $AlO+H_2O$

Answer:A

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

7. Sodium carbonate used in the
A) Softening hard water B) hardering water
C) Antacid D) Soap manufacture

Answer:A,D

Solution:Sodium carbonate has various industrial uses, including in the manufacture of glass, paper, and soaps/detergents as an ingredient or water softener.

8. $Ca(OH)_2 \xrightarrow{heat} ?$
A) $CaO+H_2O$ B) $Ca+H_2O$ C) $CaOH+O_2$ D) CaO_2+H_2O

Answer:A

Solution: $Ca(OH)_2 \rightarrow CaO + H_2O$

9. Baking soda used in the **(FA & SA- 3Marks/4 Marks)**
A) Antacid B) Rayon preparation
C) Cure indigestion D) Cooking

Answer:A,C,D

Solution:Baking soda used inAntacid, Cure indigestion, Cooking.

10. Bases in prenolphthalin solution

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

Answer:B

Solution:Bases in phenolphthalein solution is Pink.

JEE ADVANCED LEVEL QUESTIONS

Multi Correct Answer Type

11. Bases which will not decompose on strong heating also

A) NaOH B) KOH C) $Ca(OH)_2$ D) $Al(OH)_3$

Answer:A,B

Solution:NaOH and KOH are strong alkalis that are stable to heat and do not decompose even on strong heating

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**

12. **Statement I** : All bases decompose on heating to form their oxides and water.

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

Answer:D

Solution:Statement I: Incorrect in general — Not all bases decompose on heating.

Strong alkalis like NaOH and KOH do not decompose even on strong heating.So this statement is FALSE

Statement II: Correct

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

Comprehension type :

Potassium hydroxide is an base with the formula KOH and commonly called caustic potash.

13. The compound which is colourless and odourless in its solid state ?

A) KOH B) NaOH C) NH_4OH D) None

Answer:A,B

Solution:Both potassium hydroxide (KOH) and sodium hydroxide (NaOH) are colorless/white and odorless in their solid states.

14. Which of the following is used to study the identifying colors of mushrooms ?

A) NaOH B) NH_4OH C) $Ca(OH)_2$ D) KOH

Answer:D

Solution:Potassium hydroxide (KOH) is commonly used in mycology (study of fungi) to test and identify mushroom species, as it produces characteristic color changes on the mushroom tissues.

Matrix Matching Type :

15.

Column-I	**Column-I**
a) Acid + Base	A) NH_3 Gas
b) KOH on heat	B) Salt + H_2O
c) Ammonium salt	C) No reaction
d) KOH + CO_2	D) K_2CO_3 + H_2O

Answer:a–B, b–C, c–A, d–D

Solution:

a) Acid + Base	B) Salt + H_2O
b) KOH on heat	C) No reaction
c) Ammonium salt	A) NH_3 Gas
d) KOH + CO_2	D) K_2CO_3 + H_2O

KEY

		WORKSHEET BASED ALKALI / BASE PROPERTIES & USES							
			TEACHING TASK						
			JEE MAINS LEVEL QUESTIONS						
1	2	3	4	5	6	7	8	9	10
C	B	A	B	B	A	A	B	A	C
			JEE ADVANCED LEVEL QUESTIONS						
11	12	13	14	15					
A,B	A	A	D	a–C, b–B, c–D, d–A					
			LEARNERS TASK						
			JEE MAINS LEVEL QUESTIONS						
1	2	3	4	5	6	7	8	9	10
A	A,B	A	A	B	A	A,D	A	A,C,D	B
			JEE ADVANCED LEVEL QUESTIONS						
11	12	13	14	15					
A,B	D	A,B	D	a–B, b–C, c–A, d–D					