

MCQS/Very Short Answer Questions: (Acid and base class 10 chemistry most important questions)

Q) To protect tooth decay we are advised to brush our teeth regularly. The nature of tooth paste used is

- a) acidic
- b) neutral
- c) basic
- d)corrosive

Solution: **c) basic**

(Acid and base class 10 chemistry most important questions)

Q) Which one is stronger acid with pH=6 or with pH=2.

Solution: **pH=2**

Q) What happens when chlorine is passed over dry slaked lime.

(CBSE-2010, 2011)

Solution: **$\text{Ca(OH)}_2 + \text{Cl}_2 \rightarrow \text{Ca(OCl)}_2 + \text{H}_2\text{O}$** (The correct product notation is **Ca(OCl)_2** or

CaOCl_2)

(Acid and base class 10 chemistry most important questions)

Q) A compound 'x' in aqueous solution turns red litmus solution into blue Identify

'x'

- a) Hydrochloric acid

b) Ammonium hydroxide solution

c) Sodium chloride solution

d) Vinegar

Solution: b) Ammonium hydroxide solution

(Acid and base class 10 chemistry most important questions)

Q) Dry HCl gas does not change the colour of dry blue litmus paper why?

Solution: The reason is that HCl gas needs to be in an aqueous solution (water) to dissociate into H⁺ and Cl⁻ ions, which are necessary to affect the litmus paper. Since the HCl gas is dry, it does not have the necessary water to dissociate and therefore does not change the color of the litmus paper.

Q) Fill in the blanks
a) The chemical formula of Plaster of Paris is _____

b) Neutral substances have a pH _____

c) Gold can be dissolved in _____

d) Commonly used antacid is _____

Solution: a) $\text{CaSO}_4 \cdot \frac{1}{2}\text{H}_2\text{O}$

b) 7

c) aqua regia

d) NaHCO_3 or CaCO_3

(Acid and base class 10 chemistry most important questions)

Q) Given below are the results of solution tested with universal indicators

(i) Sulphuric acid [Red]. _____

- (ii) Metal Polish [Dark Blue]._____
- (iii) Milk of Magnesia [Light blue]._____
- (iv) Liquid Soap [Yellow]._____
- (v) Oven cleaner [Purple]._____
- (vi) Car battery acid [Pink]._____

Arrange the solutions in increasing order of their pH

Solution: (i) Sulphuric acid (Red) - pH 1-2

(ii) Metal Polish (Dark Blue)-pH-10-11

(iii) Milk of Magnesia (Light blue) - pH 8-9

(iv) Liquid Soap (Yellow) - pH 5.5-6.5

(v) Oven cleaner (Purple) - pH 12-13

(vi) Car battery acid (Colourless or slightly yellow)-pH 1-2

ph order : Sulphuric acid [Red] < Car battery acid [Pink] < Oven cleaner

[Purple] < Liquid Soap [Yellow] < Metal Polish [Dark Blue] < Milk of Magnesia [Light blue]

(Acid and base class 10 chemistry most important questions)

Q) Classify into strong and weak acid Hydrochloric acid, Formic acid nitric acid, acetic acid, Sulphuric acid, citric acid

(NCERT Exemplar)

Solution: **Strong acids:** Hydrochloric acid, Nitric acid, Sulphuric acid

Weak acids: Formic acid, Acetic acid, Citric acid

Q) Name the acid present in ant sting .

Solution: Formic acid

Q) Complete the following reaction 1. $\text{Na}_2\text{CO}_3 + \text{HCl} \rightarrow$

2. $\text{NaOH} + \text{HCl} \rightarrow$

3. $\text{CuO} + \text{HCl} \rightarrow$

4. $\text{Zn} + \text{NaOH} \rightarrow$

5. $\text{Ca}(\text{OH})_2 + \text{Cl}_2 \rightarrow$

Solution: i) $\text{Na}_2\text{CO}_3 + 2\text{HCl} \rightarrow 2\text{NaCl} + \text{CO}_2 + \text{H}_2\text{O}$

ii) $\text{NaOH} + \text{HCl} \rightarrow \text{NaCl} + \text{H}_2\text{O}$

iii) $\text{CuO} + 2\text{HCl} \rightarrow \text{CuCl}_2 + \text{H}_2\text{O}$

iv). $\text{Zn} + 2\text{NaOH} \rightarrow \text{Na}_2\text{ZnO}_2 + \text{H}_2$ (Sodium zincate and hydrogen gas)

v). $\text{Ca}(\text{OH})_2 + \text{Cl}_2 \rightarrow \text{CaOCl}_2 + \text{H}_2\text{O}$

(Acid and base class 10 chemistry most important questions)

Q) Name two constituents of baking powder.

Solution: NaHCO_3 (Sodium bicarbonate) and $\text{KHC}_4\text{H}_4\text{O}_6$ (Potassium bitartrate or cream of tartar)

Q) What happens when egg shell is added to nitric acid?

Solution: When we add egg-shell to nitric acid, the Nitric acid reacts with calcium carbonate (which is present in the egg-shell) to form calcium nitrate, carbon dioxide gas, and water. -The carbon dioxide gas released from this reaction turns lime-water milky. Therefore, we described the reaction of egg-shell with nitric acid.

Q) Name a salt which does not contain water of crystallization

Solution: NaCl (Sodium chloride)

(Acid and base class 10 chemistry most important questions)

Q) Which solution is used to dissolve gold?

Solution: Aqua regia ($\text{HNO}_3 + 3\text{HCl}$)

Q) How will you test a gas which is liberated when HCl acid reacts with an active metal?

Solution: The gas liberated when hydrochloric acid reacts with a metal is hydrogen gas.

We can confirm the presence of hydrogen gas by bringing a burning splinter

near the test tube. If it burns with a pop sound, the gas liberated is hydrogen.

Q) What is the pH of gastric juices released during digestion?

Solution: pH 1.5-3.5 (acidic)

Q) Why does flow of acid rain water into a river make the survival of aquatic life in the river difficult?

Solution: It makes the survival of aquatic life difficult because when the substances of acid rain mix with the water gain the substances and it becomes acidic and so no life is possible in acidic water so it is difficult for the aquatic life to survive in acidic water.

(Acid and base class 10 chemistry most important questions)

Q) Which by-product of chlor-alkali process is used for manufacturing bleaching powder?

Solution: The by-product of the chlor-alkali process which is used for manufacturing of bleaching powder is chlorine gas .

Q) On putting a drop of liquid on a pH paper a student observes a small patch of blue color on pH paper. The liquid is most probably

- a) H_2O
- b) HCl
- c) NaOH
- d) H_2SO_4

Solution: c) NaOH

Q) When concentrated acid is added to water, whether the process is exothermic or endothermic?

Solution: The process of dissolving an acid in water is a highly exothermic one.

(Acid and base class 10 chemistry most important questions)

Q) The colour obtained on pH paper for highly acidic, basic and neutral solutions are respectively.

- a) blue, orange, green
- b) yellow, blue, green
- c) red, blue, green
- d) Red, green, blue

Solution: c) red, blue, green

(Acid and base class 10 chemistry most important questions)

Q) If we add some sodium carbonate in distilled water, the pH of solution will be

- a) less than 7
- b) more than 7
- c) exactly 7

d) very close to 7

Solution: b) more than 7

(Acid and base class 10 chemistry most important questions)

Q) The correct method of finding the pH of solution is

a) Heat the solution in test-tube and expose the pH paper to the vapors formed

b) Pour solution on pH paper

c) Dip the pH paper in solution

d) Put a drop of solution on pH paper using dropper (CBSE-2011)

Solution: d) Put a drop of solution on pH paper using a dropper

(Acid and base class 10 chemistry most important questions)

Q) Four student- 'A', 'B', 'C' and D measured pH value of water, lemon juice and sodium bicarbonate solution. The student who has expressed correct pH values in decreasing order.

a) Water > lemon juice > Sod. bicarbonate solution

b) Lemon juice > Water > Sod. bicarbonate solution

c) Sod. bicarbonate solution > water > lemon juice

d) Water > Sod. bicarbonate solution > lemon juice (CBSE-2010)

Solution: c) Sodium bicarbonate solution > water > lemon juice

(Acid and base class 10 chemistry most important questions)

Q) Diluted HCl is added to sodium carbonate. It is observed that:-

a) No change takes place

b) Aloud sound is produced immediately

c) Immediately a brisk effervescence occurs

d) The solution turns black.

Solution: c) Immediately a brisk effervescence occurs

(Acid and base class 10 chemistry most important questions)

Q) A colourless and odourless gas is liberated when hydrochloric acid is added to solution of sodium carbonate. The name of gas is

a) Carbon dioxide

b) Nitrogen dioxide

c) Sulphur dioxide

d) Sulphur trioxide

Solution: a) Carbon dioxide

(Acid and base class 10 chemistry most important questions)

Q) When diluted HCl reacts with Zn metal the gas liberated is

a) Oxygen

b) Nitrogen

c) Chlorine

d) Hydrogen

Solution: d) Hydrogen

(Acid and base class 10 chemistry most important questions)

Q) A student added Zn granules to dil HCl and made following observations:-

i) The surface of Zn becomes black

ii) A colourless gas evolved which burns with pop/sound

iii) The solution remains colourless

The correct observations are

a) I and II

b) I and III

c) II and III

d) I, II and III

Solution: **d) I,II and III**

Q) Which of the following statement is correct:

(a) Both bases and alkalis are soluble in water

(b) Alkalis are soluble in water but all bases are not

(c) Bases are soluble in water but all alkalis are not

(d) C_2H_5OH is a base because it has OH in its formulation

Solution: **b) Alkalies are soluble in water but all bases are not**

Q) An acid can react with:

(a) AgCl

(b) Na_2CO_3

(c) $AgNO_3$

(d) None of the above

Solution: **b) Na_2CO_3**

Q) Which of the following is a neutral salt?

- (a) NaCl
- (b) Na₂SO₄
- (c) KCl
- (d) all of the above

Solution: d) all of the above

Q) Which of the following correctly represents the molecular formula of washing powder

- (a) Na₂CO₃
- (b) Na₂CO₃·H₂O
- (c) Na₂CO₃·5H₂O
- (d) Na₂CO₃·10H₂O

Solution: (d) Na₂CO₃·10H₂O

(Acid and base class 10 chemistry most important questions)

Q) A solution that turns blue litmus red, the pH of the solution will be:

- (a) 8
- (b) 10
- (c) 12
- (d) 6

Solution: d) 6

Q) Gypsum salt is

- (a) CaSO₄·2H₂O

(b) Ca_2SO_4

(c) $\text{CaSO}_4 \cdot \text{H}_2\text{O}$

(d) $\text{CaSO}_4 \cdot \frac{1}{2}\text{H}_2\text{O}$

Solution: (a) $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$

(Acid and base class 10 chemistry most important questions)

Q) Which of the following is used in making toys?

(a) $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$

(b) $\text{Na}_2\text{SO}_4 \cdot 10\text{H}_2\text{O}$

(c) $\text{CaSO}_4 \cdot \text{H}_2\text{O}$

(d) $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$

Solution: a) $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$

Q) The type of medicine used to treat indigestion and hyperacidity is:

(a) antibiotic

(b) antacid

(c) sulpha drug

(d) pain killer

Solution: b) antacid

Q) Which one of the following is a weak acid?

(a) HCl

(b) H_2CO_3

(c) HNO_3

(d) H_2SO_4

Solution: b) H_2CO_3

(Acid and base class 10 chemistry most important questions)

Q) In the following questions a statement of Assertion is followed by a statement are

given-one labeled Assertion (A) and the other labeled Reason. (R). Selected the

correct answer to these questions from the codes (a), (b), (c) and (d) as given below:

(a) Both A and R are true, and R is correct explanation of the assertion.

(b) Both A and R are true, but R is not correct explanation of the assertion.

(c) A is true, but R is false.

(d) A is false, but R is true.

i. Assertion (A): Salts are the products of the an acid-base reaction.

Reason (R): Salt may be acidic or basic.

ii. Assertion (A): NaCl is a basic salt.

Reason (R): On passing electricity aqueous solution of NaCl forms NaOH.

iii. Assertion (A): The acid must always be added slowly to water with constant

stirring.

Reason (R): The process of dissolving an acid in water is a highly exothermic.

iv. Assertion (A): A scale for measuring hydrogen ion concentration in a solution,

called pH scale.

Reason (R): Values less than 7 on the pH scale represent an acidic solution.

v. Assertion (A): Ammonium chloride is a basic salt.

Reason (R): Salts of strong acid and weak base are acidic with pH value less than 7. are the products of the an acid-base reaction.

Solution: i. (a) Both A and R are true, and R is correct explanation of the assertion.

ii. (d) A is false, but R is true.

iii. (a) Both A and R are true, and R is correct explanation of the assertion.

iv. (a) Both A and R are true, and R is correct explanation of the assertion.

v. (d) A is false, but R is true

(Acid and base class 10 chemistry most important questions)

Short Answer Type Questions: (Acid and base class 10 chemistry most important questions)

Q) Why does bleaching powder smell strongly of chlorine and does not dissolve completely in water?

Solution: Bleaching powder has a strong chlorine smell because it contains calcium hypochlorite (CaOCl_2). It doesn't dissolve completely in water due to its partial solubility.

Q) Hold one moist and one dry strip of blue litmus paper over dry HCl acid gas. Which strip will turn red and why? show the change in colour.

Solution: The moist strip of litmus paper turns red when exposed to HCl gas

because the gas reacts with moisture to form H_3O^+ ions, which turn blue litmus paper red.

Q) What is Plaster of Paris? How is it obtained from Gypsum ?

Solution: Plaster of paris is prepared by heating gypsum ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$) at 120°C in rotary kilns, where it gets partially dehydrated. The temperature should be

kept below 140°C otherwise further dehydration will take place and the setting property of the plaster will be partially reduced.

Q) What is the role of toothpastes in preventing cavities?

Solution: Toothpastes prevent cavities by removing plaque, neutralizing acid, and providing fluoride (F^-) to strengthen tooth enamel.

Q) Explain why sour substances are effective in cleaning copper vessels?

Solution: Sour substances like lemon juice clean copper vessels by dissolving the oxide layer, exposing the metal, which reacts with the acid to form a salt (CuCl_2) and water .

Q) A white powder is added while baking breads and cakes to make them soft

and What is the name of the powder ? What are its main ingredients?

Solution: Baking powder contains baking soda (NaHCO_3), cream of tartar, and an acid (like $\text{CaH}_4\text{P}_2\text{O}_8$) to produce CO_2 gas for leavening.

Q) How washing soda is prepared from baking soda?

Solution: Washing soda (Na_2CO_3) is prepared from baking soda (NaHCO_3) by heating it to remove CO_2 and H_2O .

Q) Though the compounds such as glucose and alcohol have hydrogen atoms

in their molecule, yet they are not categorized as acids. Why?

Solution: Glucose (C₆H₁₂O₆) and alcohol (C₂H₅OH) aren't acids because they don't donate H⁺ ions in aqueous solutions.

Q) What is the reaction called when an acid reacts with base to produce salt and water? Give example also.

Solution: Neutralization occurs when an acid reacts with a base to produce a salt(NaCl) and water (H₂O) (e.g., HCl + NaOH → NaCl + H₂O).

Q) Why pickles and curd are not stored in copper and brass utensils?

Solution: Pickles and curd shouldn't be stored in copper and brass utensils because the acidity can react with the metal, causing corrosion and contamination.

Q) On passing excess CO₂ through lime water, it first turns milky and then becomes colourless. Explain why ? Write chemical equations.

Solution: Excess CO₂ passed through lime water (Ca(OH)₂) forms a milky solution of calcium carbonate (CaCO₃), then becomes colorless as CO₂ continues to react, forming calcium bicarbonate (Ca(HCO₃)₂).



Q) How are bases different from alkalis? Are all bases alkalis?

Solution: Bases accept H⁺ ions or donate OH⁻ ions, while alkalis are a specific type of base that dissolves in water to produce OH⁻ ions. Not all bases are alkalis (e.g., ammonia (NH₃)).

Q) While constructing a house, a builder selects marble flooring and marble top for kitchen where vinegar and juices of lemon, tamarind etc. are more often used for cooking. Will you agree to this selection. and why?

Solution: Marble flooring and tops aren't suitable for kitchen areas where acidic substances are used, as the acid can react with calcium carbonate (CaCO₃) in marble, causing damage.

Q) Write the name and formulae of three hydrated salts.

Solution: The three formula of three hydrated salts are:

•Copper sulfate - CuSO₄·5H₂O

• Calcium chloride - CaCl₂·6H₂O

•Aluminum sulfate - Al₂(SO₄)₃·18H₂O

Q) What happens when calcium carbonate is made to react with hydrochloric acid ? Give the equation of reaction.

Solution: Calcium carbonate (CaCO₃) reacts with hydrochloric acid (HCl) to form calcium chloride (CaCl₂) and water, releasing CO₂ gas:



Q) Why metallic oxides are called basic oxides and non-metallic oxides are called acidic oxides?

Solution: Metallic oxides are basic because they react with water to form bases

(e.g., Na₂O + H₂O → 2NaOH), while non-metallic oxides are acidic because they react with water to form acids (e.g., CO₂ + H₂O → H₂CO₃).

Q) What is pH scale? What is pH value of salt formed by a (a) weak acid and strong base? (b) strong acid and strong base?

Solution: The pH scale measures the concentration of H⁺ ions, ranging from 0 (highly acidic) to 14 (highly basic). The pH value of salt formed by:

a) Weak acid and strong base: basic (pH > 7)

b) Strong acid and strong base: neutral (pH = 7)

Q) A metal compound 'A' reacts with dil H_2SO_4 to produce a gas which extinguishes a burning candle. Identify compound 'A' and gas produced. Write a balanced chemical equation for the reaction if one of compound formed is Na_2SO_4 .

Solution: Compound 'A' is sodium sulfide (Na_2S), which reacts with dilute H_2SO_4 to produce hydrogen sulfide gas (H_2S), extinguishing a burning candle:



Q) The pH of salt used to make tasty and crispy pakoras is 14 . Identify and write the chemical equation for its formation. List its two uses.

Solution: The salt with pH 14 is sodium hydroxide (NaOH), formed by the reaction of sodium metal with water:



Two uses: manufacturing soap and paper, and as a strong base in chemical reactions.

Q) A compound which is prepared by gypsum has the property of hardening

when mixed with water identify and write its chemical formulae. Write the chemical equation for preparation and mention any one use of it? (CBSE sample paper-2018)

Solution: The compound prepared from gypsum is plaster of Paris, with the chemical formula $\text{CaSO}_4 \cdot \frac{1}{2}\text{H}_2\text{O}$. It hardens when mixed with water:



One use: casting and molding.

Q) Identify the acid and base which form sodium hydrogen carbonate.

Write the chemical equation in support of your answer state whether the compound is acidic, basic or neutral. Also write the pH. (CBSE-2019)

Solution: The acid and base that form sodium hydrogen carbonate (NaHCO₃) are carbonic acid (H₂CO₃) and sodium hydroxide (NaOH):



The compound is basic (pH > 7), with a pH of around 8.

Q) 2ml of sodium hydroxide solution is added to few pieces of granulated Zn

metal taken in test-tube. When the contents are warmed, a gas is evolved which is bubbled through soap solution before testing. Write the equation of chemical reaction involved and test to detect gas. Name the gas which will be evolved when same metal reacts with solution of strong acid.

Solution: The equation for the reaction between sodium hydroxide (NaOH) and zinc metal (Zn) is:



The gas evolved is hydrogen (H₂), which is detected by bubbling it through soap solution, forming bubbles. When zinc reacts with a strong acid, hydrogen gas is also evolved.

LONG ANSWER TYPE QUESTIONS: (Acid and base class 10 chemistry most important questions)

Q) What is the chemical name and formula of bleaching powder (CaOCl₂)? What happens when bleaching powder is exposed to air for a long time? Give any two important uses of bleaching powder .

Solution: Bleaching powder is calcium (CaOCl_2). When exposed to air for a long time, bleaching powder decomposes to release chlorine gas, which reacts with moisture to form hydrochloric acid, causing the powder to lose its bleaching properties.

Two important uses:

- Disinfectant
- Bleaching agent in textile and paper industries

Q) What is water of crystallisation? Write the common name and chemical formula of a commercially important compound which has 10 molecules of water (e.g., $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$). How is this compound obtained? Write its chemical equation also. List any two uses of this compound.

Solution: Water of crystallization is the water present in a crystalline solid, usually in a definite proportion. The commercially important compound with 10 molecules of water is sodium sulfate decahydrate ($\text{Na}_2\text{SO}_4 \cdot 10\text{H}_2\text{O}$), also known as Glauber's salt.

Obtained by: Sodium sulfate decahydrate is obtained by the reaction of sodium chloride (NaCl) with sulfuric acid (H_2SO_4):



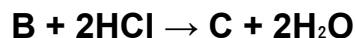
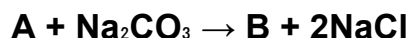
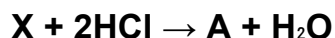
Two uses:

- Manufacturing paper and textiles
- Purifying water

Q) An element P does not react with dil. H_2SO_4 . It forms an oxide P_2O which turns red litmus into blue. Will you call P as a metal or a non-metal? Justify your answer.

Solution: **Element P is a metal. Justification: P forms an oxide (P_2O) that turns red litmus into blue, indicating basic properties. Metals tend to form basic oxides, while non-metals form acidic oxides.**

Q) . Identify the compound X on the basis of the reactions given below:



Solution: **Based on the reactions, compound X is calcium carbonate (CaCO_3).**

Reactions:



Q) A student prepared solutions of (i) an acid and (ii) a base in two separate beakers. She forgot to label the solutions and litmus paper is not available in the laboratory. Since both the solutions are colourless, how will she distinguish between the two?

Solution: **.Phenolphthalein and methyl orange are also acid-base indicators.**

They can be used in place of litmus.

Procedure: Transfer a portion of the colourless solutions to two glass tubes. Add one or two drops of phenolphthalein indicator to these. An acid solution will remain colourless while the solution of base will become pink. Now, repeat the experiment with methyl orange indicator. In acid solution, the indicator will become reddish while in base, it will be yellowish.

Q) A dry pellet of a common base B, when kept in open absorbs moisture and turns sticky. The compound is also a by-product of chloralkali process.

Identify B. What type of reaction occurs when B is treated with an acidic oxide? Write a balanced chemical equation for one such solution.

Solution: The available information suggests that the base B is sodium hydroxide (NaOH). It is a deliquescent substance and becomes sticky on absorbing moisture from atmosphere. It is commercially formed by the electrolysis of a strong solution of sodium chloride (brine).

It reacts with an acidic oxide such as CO₂ or SO₂ gas to form corresponding salt and water. For example,

