Question Bank Class 10th (Science), Acids, Bases, and Salts

Question 1.
What happens when a solution of an acid is mixed with a solution of a base in a test tube?
(i) The temperature of the solution increases
(ii) The temperature of the solution decreases
(iii) The temperature of the solution remains the same
(iv) Salt formation takes place
(a) (i) only
(b) (i) and (iii)
(c) (ii) and (iii)
(d) (i) and (iv)

Question 2.
An aqueous solution turns red litmus solution blue. Excess addition of which of the following solution would reverse the change?
(a) Baking powder
(b) Lime
(c) Ammonium hydroxide solution
(d) Hydrochloric acid

Question 3.
Two aqueous solutions P and Q have pH of 5 and 13 respectively. The correct inference is that:
(a) solution P is of HCl and Q is of NH_4OH
(b) solution P is of CH_3COOH and Q is of $Ca(OH)_2$
(c) solution P is of HNO_3 and Q is of NH_4OH
(d) solution P is of CH_3COOH and Q is of NaOH

Question 4.
The pH of a solution is 7. How can you increase its pH?
(a) By adding a small amount of acid
(b) By adding a small amount of base.
(c) By adding a small amount of salt.
(d) By passing carbon dioxide gas through it.

Question 5.
Sodium carbonate is a basic salt because it is a salt of
(a) strong acid and strong base
(b) weak acid and weak base
(c) strong acid and weak base
(d) weak acid and strong base

Question 6.
Which gas is evolved when acids react with metals?

(a) O_2

(b) CO_2

(c) H_2

(d) N_2

Question 7.
A sample of soil is mixed with water and allowed to settle. The clear supernatant solution turns the pH paper yellowish-orange. Which of the following would change the colour of this pH paper to greenish- blue?
(a) Lemon juice
(b) Vinegar
(c) Common salt
(d) An antacid

Question 8.
Which of the following gives the correct increasing order of acidic strength?
(a) Water < Acetic acid < Hydrochloric acid
(b) Water < Hydrochloric acid < Acetic acid
(c) Acetic acid < Water < Hydrochloric acid
(d) Hydrochloric acid < Water < Acetic acid

Question 9.
If a few drops of a concentrated acid accidentally spills over the hand of a student, what should be done?
(a) Wash the hand with saline solution.
(b) Wash the hand immediately with plenty of water and apply a paste of sodium hydrogencarbonate.
(c) After washing with plenty of water and apply solution of sodium hydroxide on the hand.
(d) Neutralise the acid with a strong alkali.

Question 10.
Farmers neutralise the effect of acidity of the soil by adding
(a) slaked lime
(b) gypsum
(c) caustic soda
(d) baking soda

Question 11.
A teacher gave two test tubes to the students, one containing water and the other containing sodium hydroxide. She asked them to identify the test tube containing sodium hydroxide solution. Which one of the following can be used for the identification?
(a) Blue litmus
(b) Red litmus

(c) Sodium carbonate solution
(d) Dilute hydrochloric acid

Question 12.
One of the constituents of baking powder is sodium hydrogencarbonate, the other constituent is
(a) hydrochloric acid
(b) tartaric acid
(c) acetic acid
(d) sulphuric acid

Question 13.
Increase in the OH^- ion concentration, leads to
(a) an increases in the pH of solution
(b) a decrease in the pH of the solution
(c) doesn't alter the pH of the solution
(d) decreases the basic strength of the solution

Question 14.
Which of the following statements is correct about an aqueous solution of an acid and of a base?
(i) Higher the pH, stronger the acid
(ii) Higher the pH, weaker the acid
(iii) Lower the pH, stronger the base
(iv) Lower the pH, weaker the base
(a) (i) and (iii)
(b) (ii) and (iii)
(c) (i) and (iv)
(d) (ii) and (iv)

Question 15.
A solution has turned the colour of red litmus paper to blue. The pH of the solution is approximately:
(a) 2
(b) 5
(c) 7
(d) 10

Question 16.
The pH of three solutions X, Y and Z is 6, 4 and 8 respectively. Which of the following is the correct order of acidic strength?
(a) X > Y > Z
(b) Z > Y > X
(c) Y > X > Z
(d) Z > X > Y

Question 17.
Which one of the following can be used as an acid-base indicator by a visually impaired student?
(a) Litmus
(b) Turmeric
(c) Vanilla essence
(d) Petunia leaves

Question 18.
What is gastric acid present in the stomach composed of?
(a) Hydrochloric acid
(b) Sulphuric acid
(c) Nitric acid
(d) Lactic acid

Question 19.
Which of the following is acidic in nature?
(a) Lime juice
(b) Human blood
(c) Lime water
(d) Antacid

Question 20.
When the solution of an acid is diluted, what will be the change in pH of the solution?
(a) pH of the solution remains the same
(b) pH of the solution will increase
(c) pH of the solution decreases
(d) pH of the solution climbs to 7

Question 21.
When the stopper of a bottle containing colourless liquid was removed, the bottle gave a smell like that of vinegar. The liquid in the bottle could be
(a) Hydrochloric acid solution
(b) Sodium hydroxide solution
(c) Acetic acid solution
(d) Saturated sodium bicarbonate solution

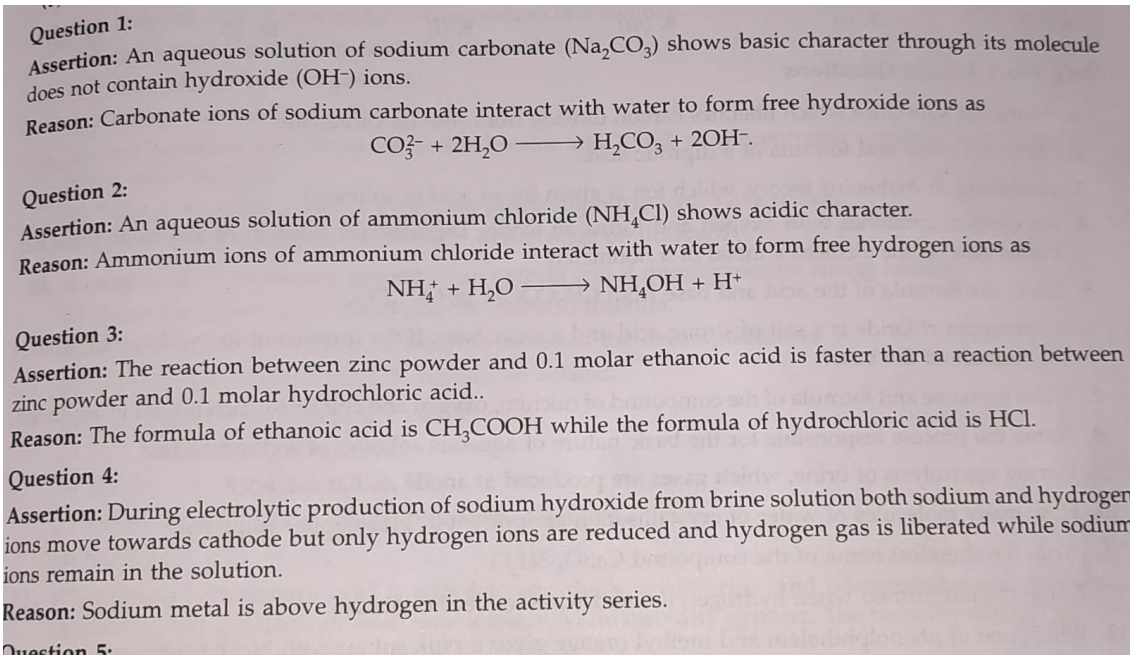
Question 22.
Which of the following is not a mineral acid?
(a) Hydrochloric acid
(b) Citric acid
(c) Sulphuric acid
(d) Nitric acid

Question 23.
Which among the following is not a base?
(a) NaOH
(b) KOH
(c) NH_4OH
(d) C_2H_5OH

Question 24.
To protect tooth decay, one is advised to brush the teeth regulary. The ingredient of the paste which checks tooth decay is:
(a) acidic
(b) basic
(c) neutral
(d) corrosive

Assertion and Reason Type Questions

Directions: In the following questions, a state of assertion(A) is followed by a reason(R). Mark the following as :
a. Both assertion(A) and reason(R) are true, and reason is the correct explanation of assertion
b. Both assertion(A) and reason(R) are true, but reason is not the correct explanation of assertion.
c. Assertion(A) is true but reason(R) is false.
d. Reason(R) is true but assertion(A) is false.



Question 1:
Assertion: An aqueous solution of sodium carbonate (Na_2CO_3) shows basic character through its molecule does not contain hydroxide (OH^-) ions.
Reason: Carbonate ions of sodium carbonate interact with water to form free hydroxide ions as

$$CO_3^{2-} + 2H_2O \longrightarrow H_2CO_3 + 2OH^-.$$

Question 2:
Assertion: An aqueous solution of ammonium chloride (NH_4Cl) shows acidic character.
Reason: Ammonium ions of ammonium chloride interact with water to form free hydrogen ions as

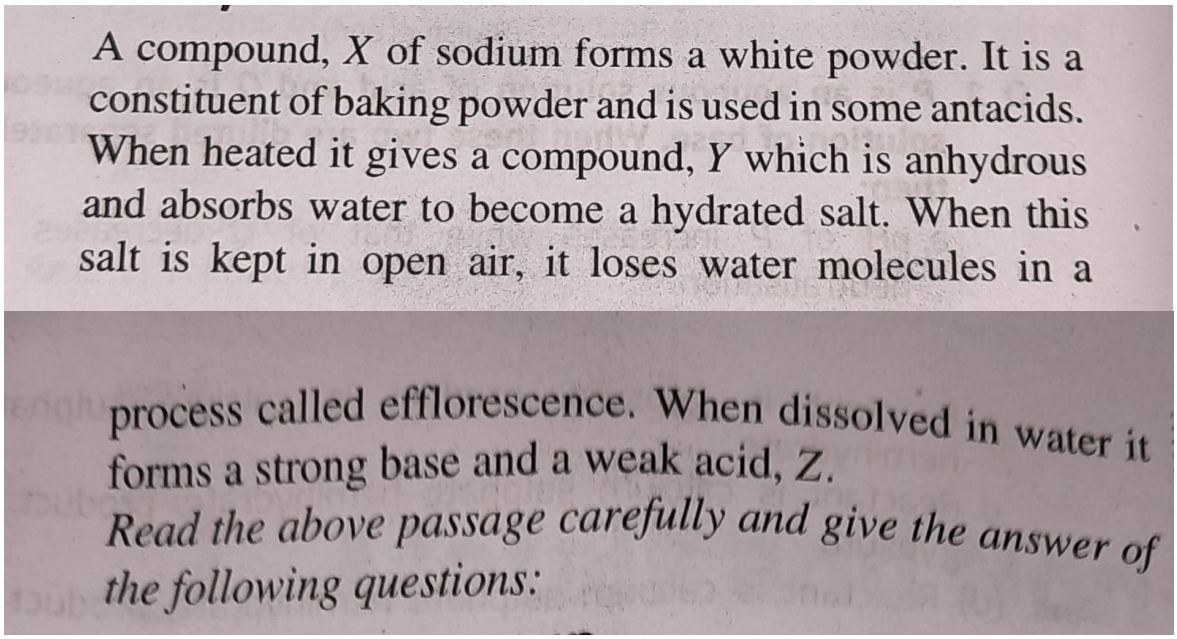
$$NH_4^+ + H_2O \longrightarrow NH_4OH + H^+$$

Question 3:
Assertion: The reaction between zinc powder and 0.1 molar ethanoic acid is faster than a reaction between zinc powder and 0.1 molar hydrochloric acid..
Reason: The formula of ethanoic acid is CH_3COOH while the formula of hydrochloric acid is HCl.

Question 4:
Assertion: During electrolytic production of sodium hydroxide from brine solution both sodium and hydrogen ions move towards cathode but only hydrogen ions are reduced and hydrogen gas is liberated while sodium ions remain in the solution.
Reason: Sodium metal is above hydrogen in the activity series.

Question 5:

Case Study 1:



A compound, *X* of sodium forms a white powder. It is a constituent of baking powder and is used in some antacids. When heated it gives a compound, *Y* which is anhydrous and absorbs water to become a hydrated salt. When this salt is kept in open air, it loses water molecules in a process called efflorescence. When dissolved in water it forms a strong base and a weak acid, *Z*.

Read the above passage carefully and give the answer of the following questions:

Q.1. What is the compound X?
(a) $NaHCO_3$
(b) Na_2CO_3
(c) NaOH
(d) NaCl

Q.2. The compound Y is:
(a) $NaHCO_3$
(b) Na_2CO_3
(c) $Na_2CO_3.10H_2O$
(d) NaCl

Q.3. What is the nature of the solution formed by dissolving Y in water?
(a) Alkaline
(b) Acidic
(c) Neutral
(d) it remains insoluble

Q.4. Identify the compound Z
(a) CO_2
(b) H_2CO_3
(c) NaOH
(d) H_2O

Q.5. Sodium Carbonate is a basic compound, it is a salt of
(a) strong acid and strong base
(b) weak acid and weak base
(c) strong acid and weak base
(d) weak acid and strong base

Case Study 2:

A group of students measured the pH of some substances they found in their homes. Their results are given in the following table:

Substances	pH	Substances	pH
Apples	3.0	Vinegar	3.0
Salt	7.0	Lemon juice	2.5
Baking soda	8.5	Washing soda	11.5
Sugar	7.0	Milk	6.5
Black coffee	5.0	Household ammonia	12.0
Toothpaste	9.0		

Read the above passage carefully and give the answer of the following questions:

Q 1. Which solution is the most acidic?

a. Apples
b. Vinegar
c. Lemon Juice
d. Black Coffee

A

Q 2. Which solution is the most alkaline?

a. Household ammonia
b. Washing soda
c. Baking soda
d. Toothpaste

An

Q 3. Which solutions are neutral?

a. Salt
b. Sugar
c. Milk
d. Both a. and b.

Ans.

Q 4. What will be the litmus test if the solution is basic?

a. Red litmus will turn to blue
b. Blue litmus will turn to red
c. No change in colour
d. It will change into orange pink

Q 5. Arrange the following in order of the increasing basic strengths: Baking soda, toothpaste, Household ammonia, Washing soda

a. Baking soda, Toothpaste, Household ammonia, Washing soda
b. Baking soda, Toothpaste, Washing soda, Household ammonia
c. Washing soda, Baking soda, Toothpaste, Household ammonia
d. Baking soda, Household ammonia, Toothpaste, Washing soda