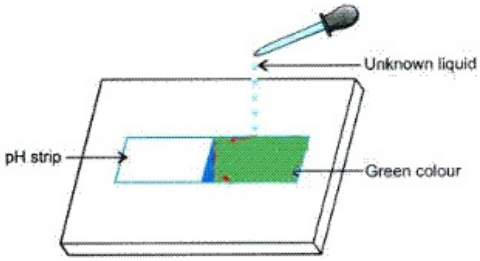
**CBSE Test paper 05**

**Chapter 02 Acids Bases and Salts**

1. On putting few drops of an unknown liquid on pH strip, the colour of pH strip changed to green. The liquid taken is likely to be **(1)**




   a. pH paper shows green colour with water us neutral.
   b. dilute sodium hydroxide solution
   c. dilute hydrochloric acid
   d. lemon juice

2. Which of the following properties are shown by dilute hydrochloric acid- **(1)**

   A. It turns blue litmus red
   B. It turns red litmus blue
   C. It reacts with zinc metal and a gas evolves
   D. It reacts with solid sodium carbonate to give brisk effervescence

   a. A, B and D
   b. A, C and D
   c. A and B
   d. A and C

3. All metal carbonates and hydrogen carbonates react with acids to form the corresponding **(1)**

   a. acid
   b. salt
   c. base
   d. precipitate

4. On introducing a strip of pH paper in 1.0 ml of the given solution, the pH paper changed to light red. The given solution could be of **(1)**

    a. A mixture of sodium hydroxide and sodium bicarbonate
    b. Sodium bicarbonate
    c. Sodium hydroxide
    d. Ethanoic acid

5. Raw materials for baking powder are **(1)**

    a. sodium carbonate and tartaric acid
    b. baking soda and tartaric acid
    c. baking soda and carbonic acid
    d. washing soda and tartaric acid

6. What is the action of calcium oxide with dil HCl ? **(1)**

7. How is the concentration of hydronium ions ($H_3O^+$) affected when a solution of an acid is diluted? **(1)**

8. What happens when a solution of an acid is mixed with a solution of a base in a test tube? **(1)**

9. What is base? **(1)**

10. Farmers are using a large number of pesticides and fertilisers in their fields to increase crop production and to enhance their profits. But by doing so, they are causing damage to the soil as well as to the environment. Do you agree with this statement? Why should we avoid eating fruits and vegetables without washing them properly? **(3)**

11. Rahul was playing with his friends. Suddenly, Rahul was stung by a honeybee and was in great pain. Immediately, his friends call his mother. She applied a coating of toothpaste on the affected area and then took him to the doctor.
    Read the above passage and answer the following questions. **(3)**

    i. What could be the reason for this burning pain?
    ii. Why did his mother applied toothpaste on the affected area?

iii. What qualities are possessed by Rahul's friends?

12. How do metal carbonate react with acids ? Give one example. **(3)**

13. What is the action of zinc with dilute sulphuric acid? **(3)**

14. Explain hydrolysis of various types of salts. **(5)**

15. What is water of crystallisation? Write the common name and chemical formula of a commercially important compound which has ten water molecules as water of crystallisation. How is this compound obtained? Write the chemical equation also. List any two uses of this compound. **(5)**

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## Chapter 02 Acids Bases and Salts

### Answers

1. a. pH paper shows green colour with water us neutral.
   **Explanation:** pH strip shows green colour with water.

2. b. A, C and D
   **Explanation:** HCl being an acid turns blue litmus red.
   HCl reacts with zinc metal to evolve hydrogen gas.
   HCl reacts with solid sodium carbonate ($Na_2CO_3$) to evolve carbon dioxide ($CO_2$) gas.

3. b. salt
   **Explanation:** Carbonates and hydrogen carbonates are types of base. They make a salt and water when we neutralise them with acid we get carbon dioxide gas.
   The reaction fizzes as bubbles of carbon dioxide are given off. This is easy to remember because we see the word 'carbonate' in the chemical names.
   acid + metal hydrogen carbonate → a salt + water + carbon dioxide

4. d. Ethanoic acid
   **Explanation:** Ethanoic acid will turn pH paper light red because it is weakly acidic.

5. b. baking soda and tartaric acid
   **Explanation:** Baking powder is a solid mixture that is used as a chemical leavening agent in baked goods. Baking powder is a mixture of sodium hydrogen carbonate and weak edible acid named as tartaric acid.

6. Calcium oxide is a fairly strong base, and hydrochloric acid is a strong acid. The two substances readily reacts with and neutralise each other, forming the soluble salt calcium chloride ($CaCl_2$) and water.

   $CaO + 2HCl\ (dil) \rightarrow CaCl_2 + H_2O$

7. When a solution of an acid is diluted, the concentration of hydronium ions ($H_3O^+$) per unit volume in the solution decreases.

8. The salt formation takes place along with water when a solution of an acid is mixed with a solution of a base.

9. According to Arrhenius, a base is a substance which dissociates to give hydroxyl ($OH^-$) ions in water.

10. Plants require a specific pH range for their healthy growth. By using a large number of pesticides and fertilizers, pH of the soil changes which make it more acidic or basic. So, in the long run, the soil becomes infertile. This leads to soil erosion causing damage to the environment also. So, the use of these pesticides and fertilizers should be restricted. And these fertilizers and pesticides get deposited on the fruits and vegetables and these are toxic for us, that's why the fruits and vegetables must be properly washed before use.

11. i. The sting of a honey bee releases an acid (methanoic acid) which causes burning pain.
    ii. Toothpaste contains some basic ingredients which neutralize the effect of methanoic acid (HCOOH) and gave relief.
    iii. Rahul's friends are caring and responsible. They are supportive and helpful, too

12. Metal carbonates react with acids to give salt, carbon dioxide and water.
    Metal carbonate + Acid → Salt + Carbon dioxide + Water
    e.g. $Na_2CO_3 + 2HCl \rightarrow 2NaCl + H_2O + CO_2 \uparrow$

13. Zinc is more reactive than hydrogen and it displaces hydrogen from dilute acids. Zinc reacts with dilute sulphuric acid to form zinc sulphate and hydrogen gas is evolved. This is a single displacement reaction of a non-metal by a metal.
    $Zn(s) + H_2SO_4$ (Dil) $\rightarrow ZnSO_4(aq) + H_2$ (g)

14. i. Hydrolysis of a salt of a strong acid and weak base. They give acidic solutions in water.

$$\underset{Iron(III)\ Chloride}{FeCl_3} + 3H_2O \leftrightharpoons \underset{strong\ acids}{HCl} + \underset{weak base}{Fe(OH)_3}$$

$\underset{Copper II)\ Sulphate}{CuSO_4}$ + $2H_2O \leftrightharpoons H_2SO_4 + Cu(OH)_2$

ii. Hydrolysis of a salt of a weak acid and a strong base. They give basic solution in water.

$\underset{Sodium II)\ Carbonate}{Na_2CO_3}$ + $2H_2O \leftrightharpoons \underset{weak\ acid}{H_2CO_3} + \underset{Strong\ base}{2NaOH}$

iii. Hydrolysis of a salt of a weak acid and a weak base. They give acidic, neutral or basic (or alkaline) solutions in water depending upon the nature of weak acid and a weak base from which salt is produced.

e.g. Ammonium acetate ($CH_3COONH_4$) gives neutral solution on hydrolysis.

Ammonium carbonate, $(NH_4)CO_3$ given neutral solution on hydrolysis.

e.g. NaCl, KCl, $KNO_3$ $NaNO_3$ etc.

15. The water molecules which form the part of the structure of a crystal of salt are water **of crystallization.** The common name for the compound is **washing soda** and the chemical formula is **$Na_2CO_3 .10H_2O$**

**Preparation:** A cold and concentrated solution of Brine is reacted with ammonia and carbon dioxide to obtain sodium hydrogen carbonate which is further separated by filtration, dried and heated. On heating, sodium hydrogen carbonate decomposes to form sodium carbonate which is recrystallized with water to form washing soda crystal.

$NaCl + H_2O + CO_2 + NH_3 \rightarrow NH_4Cl + NaHCO_3$

$2NaHCO_3 + Heat \rightarrow Na_2CO_3 + CO_2 + H_2O$

$Na_2CO_3 + 10H_2O \rightarrow Na_2CO_3.10H_2O$

**Uses:**

- It is used to remove permanent hardness of water.
- it is used in manufacturing of glass.