Worksheet 2.1

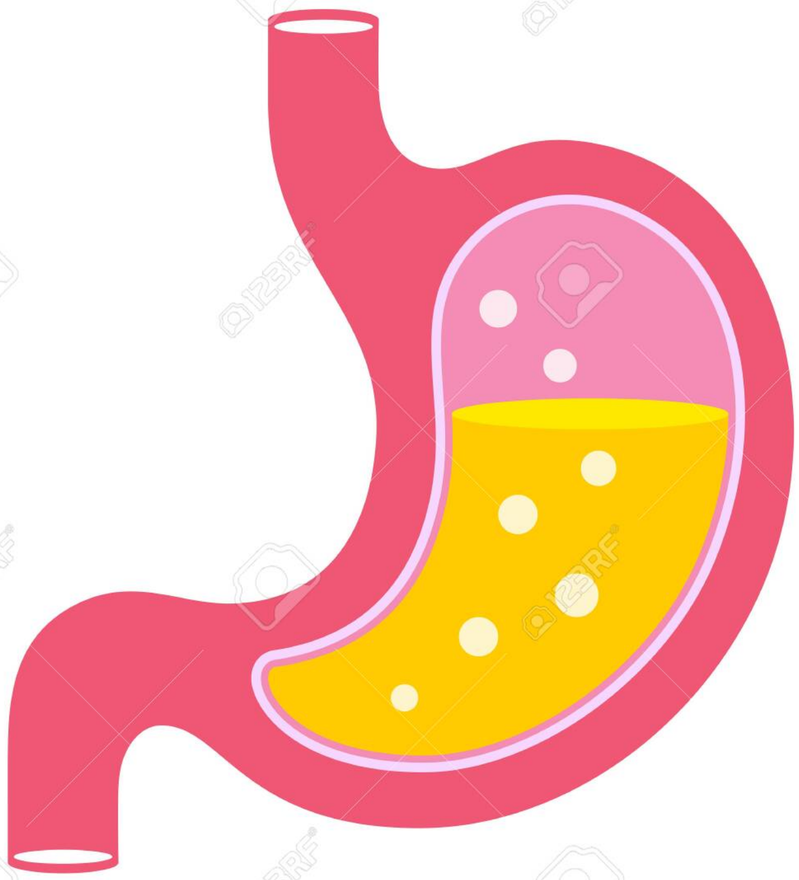
Marks - 25

Case study based questions

10th Science

Acids, Bases and Salts

Passage - 1 **5 Marks**



Ram was suffering from a stomach pain for a number of days. He consulted a doctor who advised him to take two antacid tablets after each meal for about a week and avoid spicy food. Ram followed the advice strictly and was cured.

Q 1. What was the problem faced by Ram ?

(1) Anaemia
(2) Acidity
(3) Anxiety

Q 2. True or false. The antacid tablets contain base like $NaHCO_3$ or $Mg(OH)_2$ which neutralise the affect of HCl released in the stomach.

(1) TRUE

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(2) FALSE

Q 3. $NaHCO_3 + HCl \rightarrow NaCl + H_2O + CO_2$
. Is this the correct chemical reaction happening inside stomach when Ram takes antacid?

(1) YES
(2) NO
(3) MAYBE

Q 4. Antacids reduce the excess _____ in the stomach.

(1) Water
(2) Base
(3) Acid
(4) None of these

Q 5. Are antacids used to cure acidity in stomach?

(1) YES
(2) NO

Passage - 2 **5 Marks**

Worksheet 2.1

Marks - 25

Ritesh was asked to determine the melting point of a given organic solid. For this, he used a bath containing conc.
H_2SO_4
. When he was looking at the thermometer, he lost his concentration and became a little casual. The beaker containing boiling sulphuric acid fell on his clothes. His clothes were burnt and he got severe burns on hands.

Q 1. What precautions do you suggest which Ritesh should take in future?

(1) Always wear lab coat in the laboratory.
(2) Be always alert in the laboratory
(3) Keep himself at a distance from the table where the bath is placed
(4) All of the above

Q 2. Why did ritesh's clothes burn?

(1) Base fell on the clothes
(2) Acid fell on the clothes

Worksheet 2.1

Marks - 25

Q 3. Which solution causes burns ?

(1) Acid
(2) Base

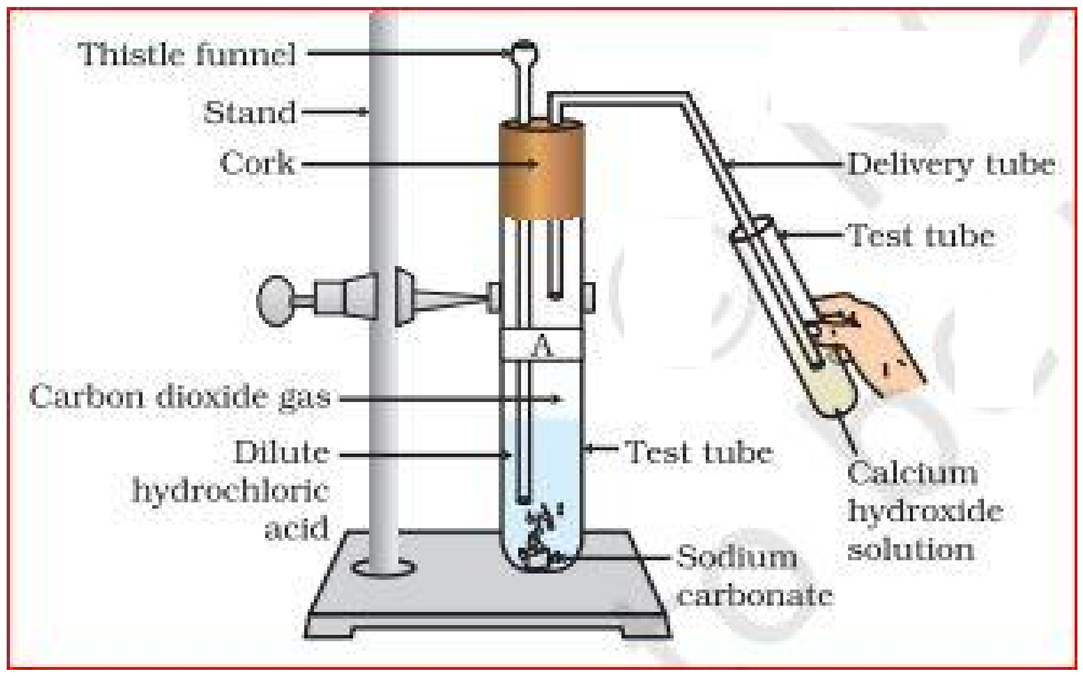
Q 4. What is pH range of acid?

(1) 0-7
(2) 7-14

Q 5. What is the pH range of base ?

(1) 0-7
(2) 7-14

Passage - 3 **5 Marks**



Refer to above figure. Neha took two test tubes, labelled them as A and B. Then she took about 0.5 g of sodium carbonate (Na_2CO_3) in test tube A and about 0.5 g of sodium hydrogencarbonate $(NaHCO_3)$ in test tube B. She added about 2 mL of dilute HCl to both the test tubes.

Q 1. Which gas is evolved when HCl is passed through test tube A?

(1) Oxygen
(2) Carbon dioxide
(3) Nitrogen
(4) Carbon monoxide

Q 2. Which gas is evolved when HCl is passed through test tube B?

(1) Carbon dioxide
(2) Nitrogen
(3) Carbon monoxide
(4) Oxygen

Q 3. On passing the carbon dioxide gas evolved through lime water, then lime water-

(1) Turns greenish
(2) Turns yellow
(3) Turns milky
(4) No change

Q 4. All metal carbonates and hydrogencarbonates react with acids to give a corresponding _____

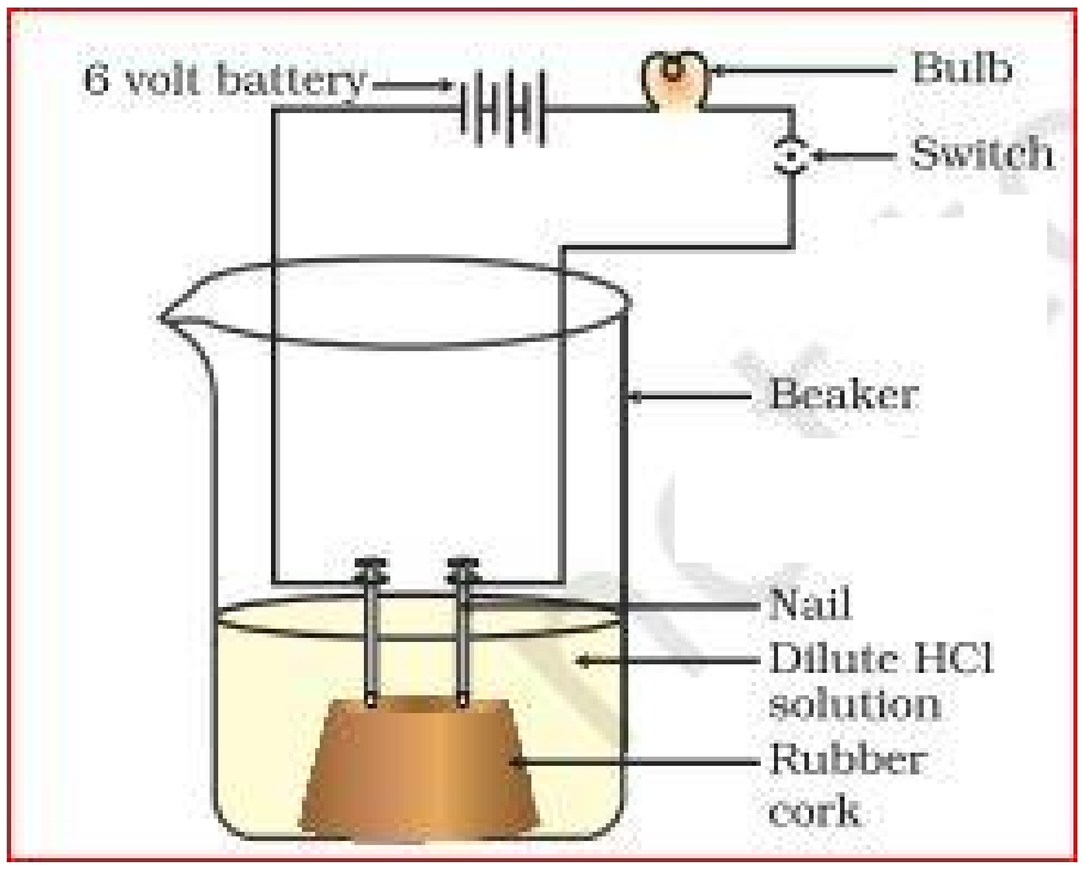
(1) Salts
(2) Carbon dioxide
(3) Water
(4) All of these

Q 5. What are the different forms of calcium carbonate?

(1) limestone
(2) Chalk

(3) Marble
(4) All of these

Passage - 4 **5 Marks**



Refer to the above figure. A student took solutions of glucose, alcohol, hydrochloric acid, sulphuric acid, etc. He fixed two nails on a cork, and placed the cork in a 100 mL beaker. He connected the nails to the two terminals of a 6 volt battery through a bulb and a switch, as shown in the above figure. He then poured some dilute HCl in the beaker and switched on the current.

Q 1. Does the bulb glow in case of alcohol and glucose?

(1) YES
(2) NO

Q 2. Does the bulb glow in case of hydrochloric acid and sulphuric acid?

(1) YES
(2) NO

Worksheet 2.1

Marks - 25

Q 3. The bulb glows in case of acids. The electric current is carried through the acidic solution by ____

(1) Filament
(2) Glass
(3) Ions
(4) Particles

Q 4. True or false. Glowing of the bulb indicates that there is a flow of electric current through the solution.

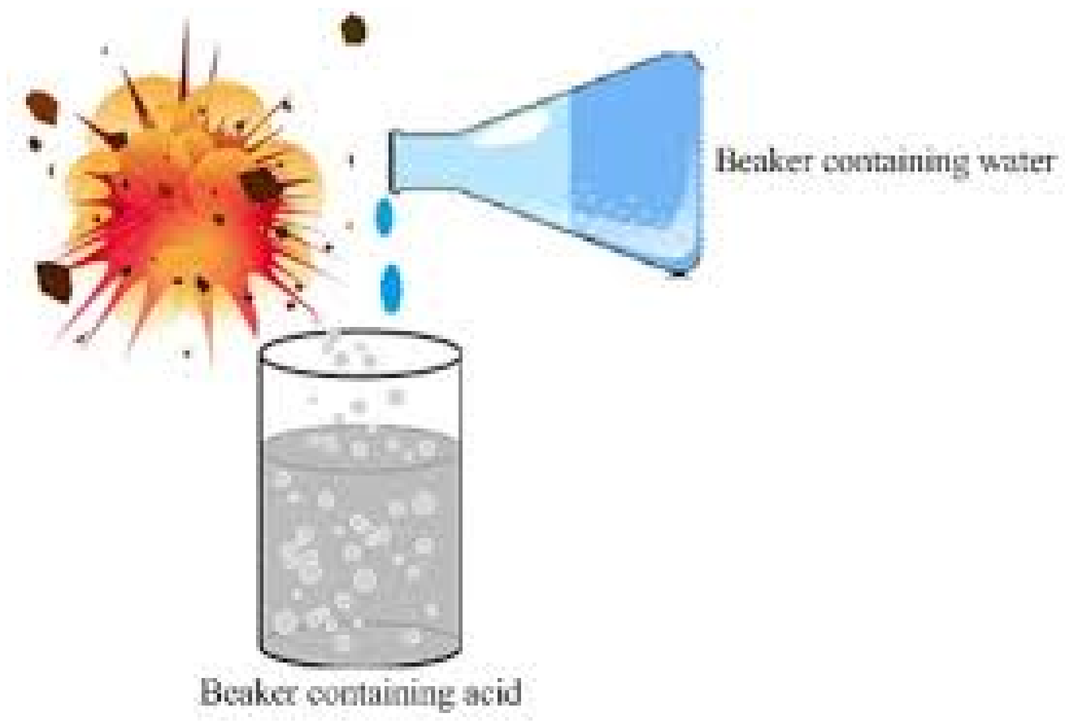
(1) TRUE
(2) FALSE

Q 5. True or false. The bulb will glow in case of an alkali like sodium hydroxide, calcium hydroxide, etc.

(1) TRUE
(2) FALSE

Passage - 5

5 Marks



Care must be taken while mixing concentrated nitric acid or sulphuric acid with water. The acid must always be added slowly to water with constant stirring. If water is added to a concentrated acid, the heat generated may cause the

mixture to splash out and cause burns. The glass container may also break due to excessive local heating. Mixing an acid or base with water results in decrease in the concentration of ions
(H_3O^+/OH^-)
per unit volume. Such a process is called dilution and the acid or the base is said to be diluted.

Q 1. When acid is added to beaker containing water which of the following statement(s) is(are) true about temperature of beaker?

(1) Temperature decreases
(2) Temperature increases
(3) No change in temperature

Q 2. Is process of adding acid to water an exothermic or endothermic process?

(1) Exothermic
(2) Endothermic

Q 3. What happens to concentration of ions per unit volume when water is added to acid or base?

(1) Concentration of ions decreases
(2) Concentration of ions increases

Q 4. True or false. Concentration of hydronium ions (H_3O^+) is affected when a solution of an acid is diluted.

(1) TRUE
(2) FALSE

Worksheet 2.1

Marks - 25

Q 5. While diluting an acid, what should be added first, water or acid?

(1) Acid to water slowly
(2) Water to acid slowly
(3) Any of it can be added first
(4) None of these

Worksheet 2.2

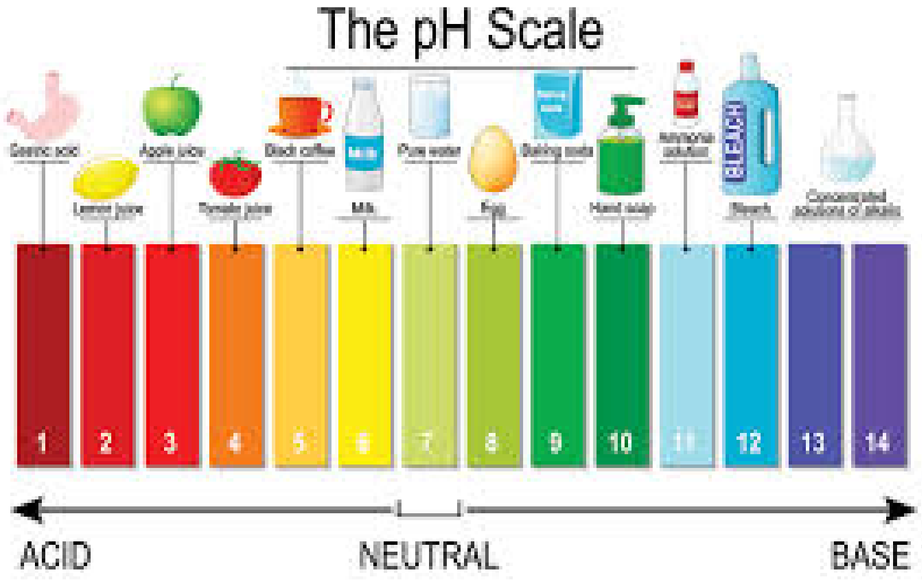
Marks - 31

Case study based questions

10th Science

Acids, Bases and Salts

Passage - 1 **11 Marks**



The strength of acids and bases depends on the number of H^+ ions and OH^- ions produced, respectively. If we take hydrochloric acid and acetic acid of the same concentration, say one molar, then these produce different amounts of hydrogen ions. Acids that give rise to more H^+ ions are said to be strong acids, and acids that give less H^+ ions are said to be weak acids.

Q 1. True or false. The acids that give rise to more OH^+ are called strong acids as well as strong bases.

(1) TRUE
(2) FALSE

Q 2. Which of the following is the strong acid?

(1) Acetic acid
(2) Formic acid
(3) Hydrochloric acid
(4) None of these

Worksheet 2.2

Marks - 31

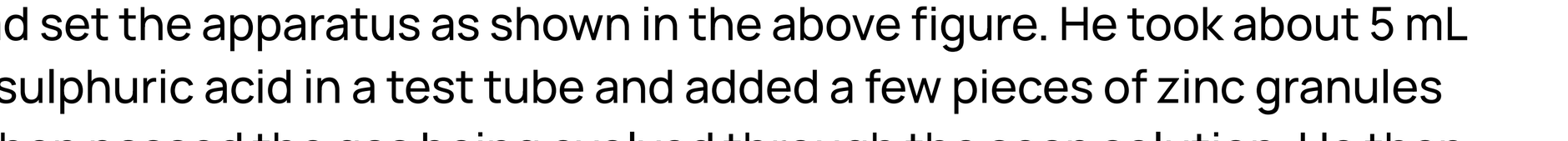
Q 3. Does OH^- and H^+ ions determine the strength of an acid or a base?

(1) YES
(2) NO
(3) MAYBE

Q 4. Which one is correctly matched about acids?

(1) Acid- pH above 7
(2) Acid- pH below 7
(3) Acid- pH equal to 7
(4) None of these

Q 5. Which of the following is neither an acid nor base?

(1) 
(2)
(3)
(4) 

Q 6.
Ashok had set the apparatus as shown in the above figure. He took about 5 mL of dilute sulphuric acid in a test tube and added a few pieces of zinc granules to it. He then passed the gas being evolved through the soap solution. He then take a burning candle near a gas filled bubble.

Q 7. The zinc metal in the above reactions displaces hydrogen atoms from the acids as hydrogen gas and forms a compound called as _____.

(1) Salt

---

(2) Metal
(3) Base
(4) None of these

Q 8. The above experiment by Ashok was done to test which gas?

(1) Hydrogen gas
(2) Oxygen gas
(3) Nitrogen gas
(4) Chlorine gas

Q 9. Which of the following is the reaction of a metal with an acid?

(1) $Base + Metal \longrightarrow Salt + Hydrogen\ gas$
(2) $Acid + Metal \longrightarrow Salt + Oxygen\ gas$
(3) $Acid + Metal \longrightarrow Salt + Hydrogen\ gas$
(4) None of these

Q 10. What will happen if copper turning is taken in place of zinc granules?

(1) The reaction will speed up
(2) The rate of hydogen gas formation is decreased
(3) No reaction will take place
(4) None of these

Q 11. Zinc chloride and hydrogen gas are formed, when zinc granules are treated with _____

(1) Sulphuric acid
(2) Hydrochloric acid
(3) Nitric acid
(4) Acetic acid

Worksheet 2.2

Marks - 31

Passage - 2

5 Marks

The acids are sour in taste and change the colour of blue litmus to red, whereas, bases are bitter and change the colour of the red litmus to blue. Litmus is a natural indicator, turmeric is another such indicator. A stain of curry on a white cloth becomes reddish-brown when soap, which is basic in nature, is scrubbed. It turns yellow again when the cloth is washed with plenty of water.

Q 1. When the litmus solution is neither acidic nor basic, its colour is _____

(1) Blue
(2) Red
(3) Purple
(4) None of these

Q 2. There are many other natural materials which indicate the presence of acid or base in a solution. These are called _____

(1) Signals
(2) Indicators

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(3) Both A and B
(4) None of these

Q 3. Synthetic indicators such as _____ are used to test for acids and bases.

(1) Methyl orange
(2) Phenolphthalein
(3) Both A and B
(4) None of these

Q 4. Natural indicator is

(1) Methyl orange
(2) Turmeric
(3) Aloe vera
(4) None of these

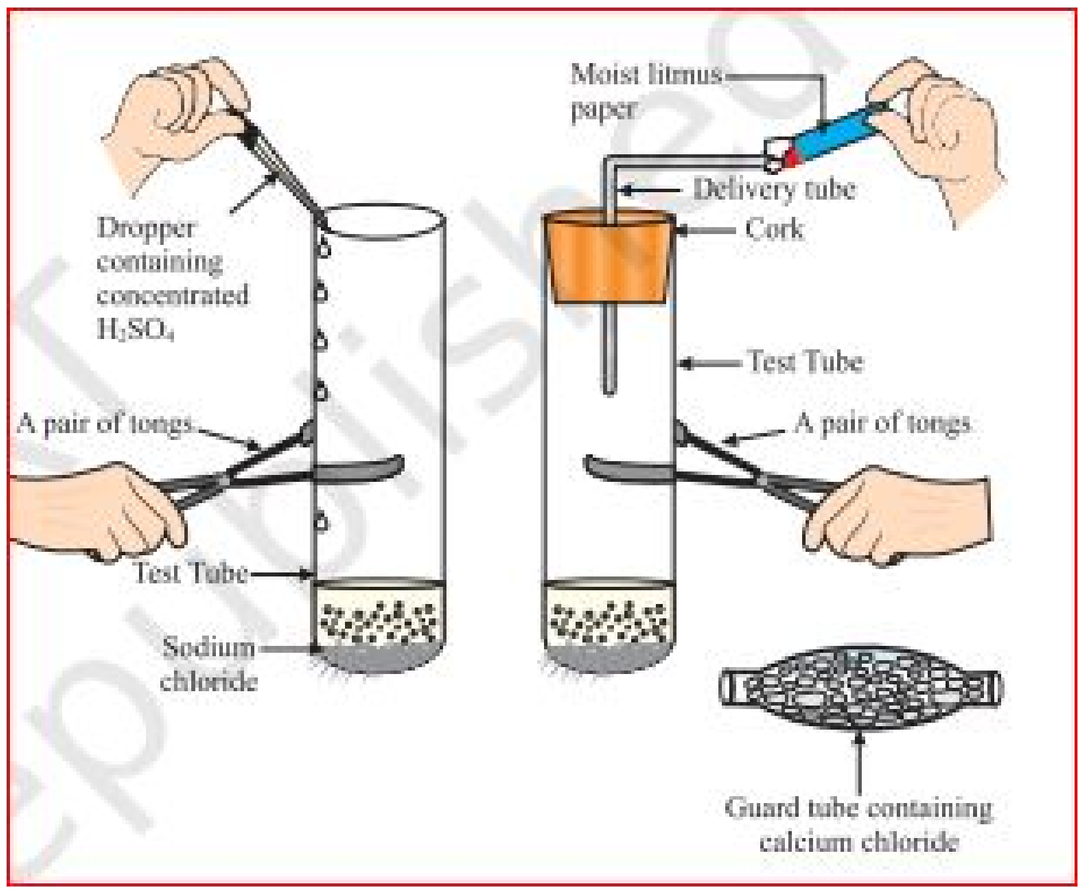
Q 5. Soap changes red litmus blue. Yes or No?

(1) YES
(2) NO

Passage - 3 **5 Marks**

Worksheet 2.2

Marks - 31



Krisha of class X took about 1g solid NaCl in a clean and dry test tube and had set up the apparatus as shown in the above figure. She added some concentrated sulphuric acid to the test tube. Gas came out of the delivery tube. She tested the gas evolved successively with dry and wet blue litmus paper.

Q 1. Which gas is coming out of the delivery tube?

(1) NaCl gas
(2) HCl gas
(3) NO gas
(4) None of these

Q 2. In which case does the litmus paper will change colour?

(1) Wet blue litmus paper
(2) Dry blue litmus paper
(3) Both A and B
(4) None of these

Worksheet 2.2

Marks - 31

Q 3. True or false. Dry HCl does not contain any hydrogen ions (H+) in it , so it does not show acidic behaviour so HCl gas does not change the colour of the dry blue litmus paper.

(1) TRUE
(2) FALSE

Q 4. HCl shows _____ properties because H+ ions are produced when HCl dissolves in water.

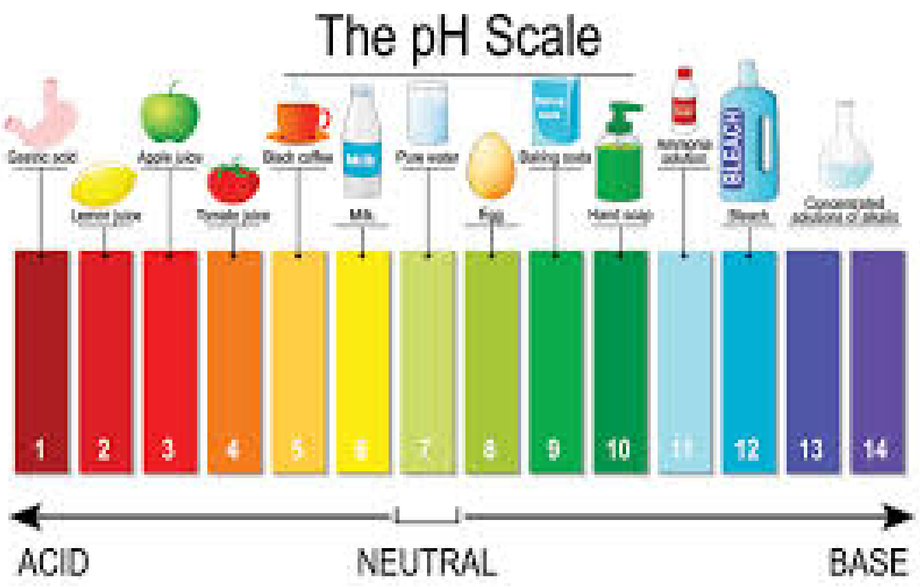
(1) Basic
(2) Acidic
(3) Neutral
(4) None of these

Q 5. Dry HCl gas is acidic in nature. Yes or No?

(1) YES
(2) NO

Passage - 4

5 Marks



A scale for measuring hydrogen ion concentration in a solution, called pH scale has been developed. The p in pH stands for 'potenz' in German, meaning power. On the pH scale we can measure pH generally from 0 (very acidic) to 14 (very alkaline). pH should be thought of simply as a number which indicates the

acidic or basic nature of a solution. Higher the hydronium ion concentration, lower is the pH value.

Q 1. pH value for acidic solution lies between-

(1) 7 to 14
(2) 0 to 7

Q 2. pH value for basic solution lies between-

(1) 7 to 14
(2) 0 to 7

Q 3. pH value for neutral solution is-

(1) 6
(2) 7
(3) 8
(4) None of these

Q 4. True or false. The pH value increases from 7 to 14, it represents an increase in OH^- ion concentration in the solution.

(1) TRUE
(2) FALSE

Q 5. True or false. The pH value increases from 0 to 7, it represents an increase in OH^- ion concentration in the solution.

Worksheet 2.2

Marks - 31

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(1) TRUE
(2) FALSE

Passage - 5

5 Marks

Tooth decay starts when the pH of the mouth is lower than 5.5. Tooth enamel, made up of calcium hydroxyapatite (a crystalline form of calcium phosphate) is the hardest substance in the body. It does not dissolve in water, but is corroded when the pH in the mouth is below 5.5. Bacteria present in the mouth produce acids by degradation of sugar and food particles remaining in the mouth after eating. The best way to prevent this is to clean the mouth after eating food. Using toothpastes, which are generally basic, for cleaning the teeth can neutralise the excess acid and prevent tooth decay.

Q 1. pH of the mouth should be within-

(1) 7.6-8.2
(2) 6.2-7.6
(3) 5.6-6.2
(4) 5.5

Q 2. True or false. During tooth decay, basic substances are used to increase the pH of the mouth.

(1) TRUE

---

(2) FALSE

Q 3. Bacteria present in the mouth produce _____ by degradation of sugar and food particles remaining in the mouth after eating.

(1) Acids
(2) Base
(3) Salts
(4) None of these

Q 4. Prevention of tooth decay can be done by-

(1) Clean the mouth before eating
(2) Clean the mouth after eating
(3) Drink water to remove germs
(4) Gargle mouth with HCl

Q 5. True or false. Tooth decay starts when the pH of the mouth is higher than 5.5.

(1) TRUE
(2) FALSE