Answer Key 2.3

Marks - 25

Case study based questions

10th Science

Acids, Bases and Salts

Passage - 1 **5 Marks**

Our body works within the pH range of 7.0 to 7.8. Living organisms can survive only in a narrow range of pH change. When pH of rain water is less than 5.6, it is called acid rain. When acid rain flows into the river, it lowers the pH of the river water. The survival of aquatic life in such rivers becomes difficult.

Q1. (1) Acidic

Q2. (4) 4

Q3. (2) Alkaline

Q4. (1) 7 to 9

Q5. (1) TRUE

Passage - 2 **5 Marks**

Answer Key 2.3

Marks - 25

The fixed number of water molecules present in one formula unit of a salt is called water of crystallisation. For instance, there are five molecules of water in one formula unit of copper sulphate and hence the chemical formula for hydrated copper sulphate is
$CuSO_4.5H_2O$
. Gypsum has two molecules of water as water of crystallisation and hence the chemical formula for hydrated gypsum stands out to be
$CaSO_4.2H_2O$
This gypsum on getting heated loses water molecules and becomes calcium sulphate hemihydrate (CaSO4.
$\frac{1}{2}$
H2O). This is known as plaster of Paris. Plaster is used for supporting fractured bones in their appropriate position

Q1. (2) 2

Q2. (1) $CaSO_4.\frac{1}{2}H_2O$

Q3. (2) $CaSO_4.2H_2O$

Q4. (2) 373

Q5. (2) FALSE

Passage - 3 **5 Marks**

Answer Key 2.3

Marks - 25

Nettle is a herbaceous plant which grows in the wild. Its leaves have stinging hair, which cause painful stings when touched accidentally. This is due to the methanoic acid secreted by them. A traditional remedy is rubbing the area with the leaf of the dock plant, which often grows beside the nettle in the wild.

Q1. (3) Methanoic acid

Q2. (2) Dock

Q3. (1) TRUE

Q4. (1) YES

Q5. (2) Basic

Passage - 4 **5 Marks**

Answer Key 2.3

Marks - 25

Seawater contains many salts dissolved in it. Sodium chloride is separated from these salts. Deposits of solid salt are also found in several parts of the world. These large crystals are often brown due to impurities. This is called rock salt. Beds of rock salt were formed when seas of bygone ages dried up. Rock salt is mined like coal

Q1. (3) Common salt

Q2. (4) All of these

Q3. (1) Water

Q4. (1) TRUE

Q5. (1) TRUE

Passage - 5 **5 Marks**

Answer Key 2.3

Marks - 25

Chlorine is produced during the electrolysis of aqueous sodium chloride (brine). This chlorine gas is used for the manufacture of bleaching powder. Bleaching powder is produced by the action of chlorine on dry slaked lime [$Ca(OH)_2$]. Bleaching powder is represented as $CaOCl_2$, though the actual composition is quite complex.

Q1. (1) Electrolysis

Q2. (2) Bleaching powder

Q3. (2) $CaOCl_2$

Q4. (1) Chlorine gas

Q5. (2) Bleaching powder

Answer Key 2.4

Marks - 25

Case study based questions

10th Science

Acids, Bases and Salts

Passage - 1 **5 Marks**

The baking soda is commonly used in the kitchen for making tasty crispy pakoras, etc. Sometimes it is added for faster cooking. The chemical name of the compound is sodium hydrogencarbonate ($NaHCO_3$). It is produced using sodium chloride as one of the raw materials

Q1. (1) Baking soda

Q2. (1) Baking soda

Q3. (2) Sodium chloride

Q4. (2) Sodium bicarbonate

Q5. (2) FALSE

Answer Key 2.4

Marks - 25

Passage - 2

5 Marks

Another chemical that can be obtained from sodium chloride is $Na_2CO_3.10H_2O$ (washing soda). Sodium carbonate can be obtained by heating baking soda; recrystallisation of sodium carbonate gives washing soda. It is also a basic salt.Sodium carbonate and sodium hydrogencarbonate are useful chemicals for many industrial processes as well.

Q1. (3) All of the above

Q2. (3) All of the above

Q3. (2) Sodium carbonate

Q4. (1) Washing soda

Q5. (4) Both A and B

Passage - 3

5 Marks

Answer Key 2.4

Marks - 25

Copper sulphate crystals which seem to be dry contain water of crystallisation. When we heat the crystals, this water is removed and the salt turns white. If you moisten the crystals again with water, you will find that blue colour of the crystals reappears. Water of crystallisation is the fixed number of water molecules present in one formula unit of a salt. Five water molecules are present in one
formula unit of copper sulphate. Chemical formula for hydrated copper sulphate is
$CuSO_4.5H_2O$
. the molecule of
$Na_2CO_3.10H_2O$
is wet.

Q1. (1) YES

Q2. (2) White

Q3. (1) $CuSO_4.5H_2O$.

Answer Key 2.4

Marks - 25

Q4. (2) Five

Q5. (2) FALSE

Passage - 4 **5 Marks**

On heating gypsum at 373 K, it loses water molecules and becomes calcium sulphate hemihydrate. This is called Plaster of Paris, the substance which doctors use as plaster for supporting fractured bones in the right position. Plaster of Paris is a white powder and on mixing with water, it changes to gypsum once again giving a
hard solid mass.

Q1. (1) 373 K

Q2. (2) Plaster of Paris

Q3. (2) Supporting fractured bones

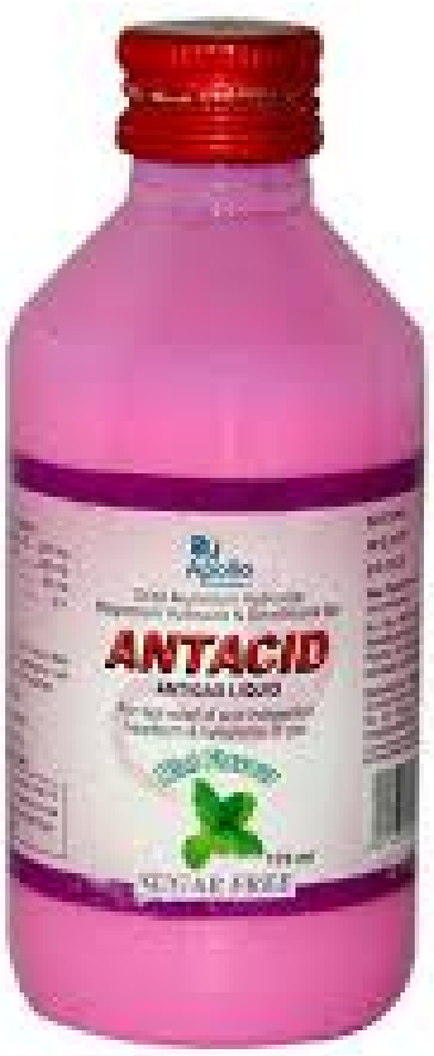
Q4. (3) White

Answer Key 2.4

Marks - 25

Q5. (1) Gypsum

Passage - 5 **5 Marks**



It is very interesting to note that our stomach produces hydrochloric acid. It helps in the digestion of food without harming the stomach.
During indigestion the stomach produces too much acid and this causes pain and irritation. To get rid of this pain, people use bases called antacids. These antacids neutralise the excess acid. Magnesium hydroxide (Milk of magnesia), a mild base, is often used for this purpose.

Q1. (1) Hydrochloric acid

Q2. (2) Too much of acid

Q3. (2) Pain and irritation

Q4. (1) Antacids

Answer Key 2.4

Marks - 25

Q5. (2) Milk of magnesium