Worksheet 1.1

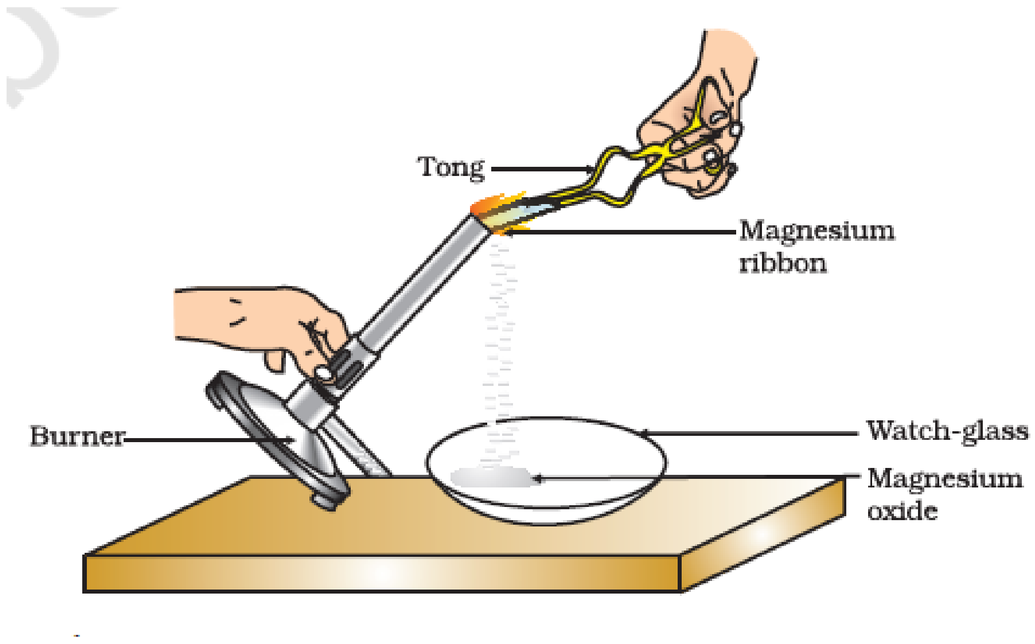
Marks - 25

Case study based questions

10th Science

Chemical Reactions and Equations

Passage - 1 **5 Marks**



In the above image, The cleaned magnesium ribbon about 3-4 cm long is burnt using a burner by holding it with a pair of tongs. And the ash so formed is collected in a watch-glass.The magnesium ribbon is kept away as far as possible from eyes.

Q 1. What is the colour of the powder collected in a watch glass ?

(1) White
(2) Grey
(3) Black
(4) Brown

Q 2. Which type of change occurs in the above experiment ?

(1) Physical
(2) Chemical
(3) No change

Q 3. What is the chemical name of the powder collected in a watch glass ?

(1) Magnesium Sulphide
(2) Magnesium Peroxide
(3) Magnesium Oxide

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(4) None of the above

Q 4. Which of the following determines the occurrence of a chemical reaction?

(1) Change in state
(2) Change in colour
(3) Change in temperature
(4) All of the above

Q 5. State true or false: Powder is always formed whenever a chemical reaction takes place.

(1) TRUE
(2) FALSE

Passage - 2 **5 Marks**

A word-equation shows change of reactants to products through an arrow placed between them. The reactants are written on the left-hand side (LHS) with a plus sign (+) between them. Similarly, products are written on the right-hand side (RHS) with a plus sign (+) between them. The arrowhead points towards the products, and shows the direction of the reaction.

Q 1. Which of the following represents the word equation of formation of water?

(1) $Hydrogen + Oxygen \rightarrow Water$
(2) $Hydrogen - Oxygen \rightarrow Water$
(3) $Hydrogen + Oxygen = Water$
(4) Both (1) and (3)

Q 2. $Magnesium + Oxygen \rightarrow Magnesiumoxide$

Which of the following is(are) reactant(s) in the above word equation?

(1) Magnesium
(2) Oxygen
(3) Both (1) and (2)
(4) Magnesium Oxide

Worksheet 1.1

Marks - 25

Q 3. State true or false: Word equation is the shortest way of representing chemical equations

(1) TRUE

(2) FALSE

Q 4. $Magnesium + Oxygen \rightarrow Magnesiumoxide$

Which of the following is(are) product(s) in the above word equation?

(1) Magnesium

(2) Oxygen

(3) Both (1) and (2)

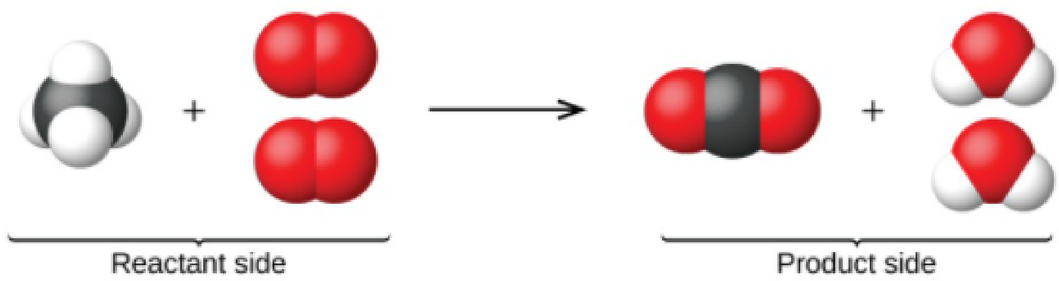
(4) Magnesium Oxide

Q 5. Which of the following represents the direction of the reaction?

(1) Plus sign

(2) Arrowhead

Passage - 3 **5 Marks**



According to the "Law of Conservation of Mass", mass can neither be created nor destroyed in a chemical reaction. That is, the total mass of the elements present in the products of a chemical reaction has to be equal to the total mass of the elements present in the reactants. In other words, the number of atoms of each element remains the same, before and after a chemical reaction. Hence, we need to balance a skeletal chemical equation.

Q 1. $Mg + O_2 \rightarrow MgO$ Is the given chemical equation balanced ?

(1) Yes

(2) No

Worksheet 1.1

Marks - 25

Q 2. Which of the following steps are involved in writing a balanced chemical equation?

(1) Word equation is written in formula form

(2) Boxes are drawn around each formula and nothing is changed inside these boxes

(3) Number of atoms of different elements present in unbalanced equation are listed

(4) All of the above

Q 3. Which of the following represents a balanced chemical equation?

(1) $2Mg + O_2 \rightarrow 2MgO$

(2) $Mg + O_2 \rightarrow 2MgO$

(3) $Mg + O_2 \rightarrow MgO$

(4) $2Mg + O_2 \rightarrow MgO$

Q 4. Why we should balance a chemical equation ?

(1) To follow law of conservation of mass

(2) To make the number of the atoms of the reactants equal to the number of the atoms of the products

(3) To make total mass of the reactants equal to the mass of the products

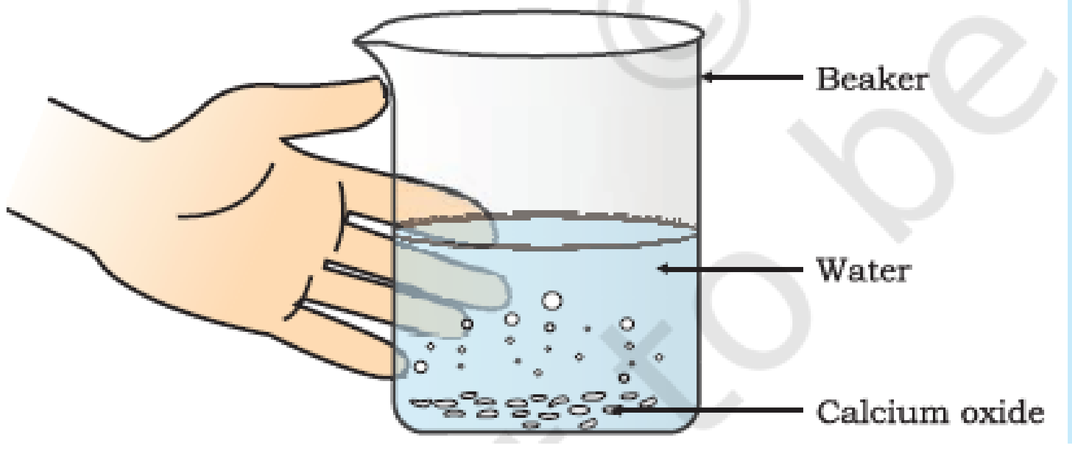
(4) All of the above

Q 5. State true or false: Word equation is a balanced chemical equation

(1) TRUE

(2) FALSE

Passage - 4 **5 Marks**



Worksheet 1.1

Marks - 25

In the above image, a small amount of quick lime is taken in a beaker and water is added to it slowly. When we touch the beaker we feel that the temperature of the beaker changes.

Q 1. The temperature of the beaker

(1) Increases
(2) Decreases

Q 2. What is chemical name of the quick lime ?

(1) Calcium hydroxide
(2) Calcium oxide
(3) Calcium sulphate
(4) Calcium phosphate

Q 3. Which of the following type of reaction takes place inside beaker ?

(1) Decomposition reaction
(2) Percipitation reaction
(3) Displacement reaction
(4) Combination reaction

Q 4. Which of the following reactions represent a combination reaction?

(1) $CaO(s) + H_2O(l) \rightarrow Ca(OH)_2(aq)$
(2) $CaCO_3(s) \rightarrow CaO(s) + CO_2(g)$
(3) $Zn(s) + CuSO_4(aq) \rightarrow ZnSO_4(aq) + Cu(s)$
(4) $2FeSO_4(s) \rightarrow Fe_2O_3(s) + SO_2(g) + SO_3(g)$

Q 5. State true or false:Quick lime reacts vigorously with water to produce slaked lime releasing a large amount of heat.

(1) TRUE
(2) FALSE

Passage - 5 **5 Marks**

Worksheet 1.1

Marks - 25

A solution of slaked lime is used for whitewashing walls. Calcium hydroxide reacts slowly with the carbon dioxide in air to form a thin layer of calcium carbonate on the walls. Calcium carbonate is formed after two to three days of whitewashing and gives a shiny finish to the walls

Q 1. Which of the following is the chemical formula of slaked lime ?

(1) CaO
(2) $Ca(OH)_2$
(3) CaOH
(4) $CaCO_3$

Q 2. Which of the following is(are) the example of a combination reaction ?

(1) Burning of coal
(2) Formation of water from Hydrogen and Oxygen.
(3) Formation of slaked lime from quick lime
(4) All of the above

Q 3. Shining finish of the walls after whitewashing is due to which of the following chemical compound ?

(1) CaO
(2) $Ca(OH)_2$
(3) CaOH
(4) $CaCO_3$

Q 4. What is the chemical formula of marble?

(1) CaOH
(2) $Ca(OH)_2$
(3) CaO
(4) $CaCO_3$

Q 5. Which of the following gas turns limewater milky ?
(1) Carbon dioxide
(2) Carbon monooxide
(3) Hydrogen
(4) Oxygen

Worksheet 1.2

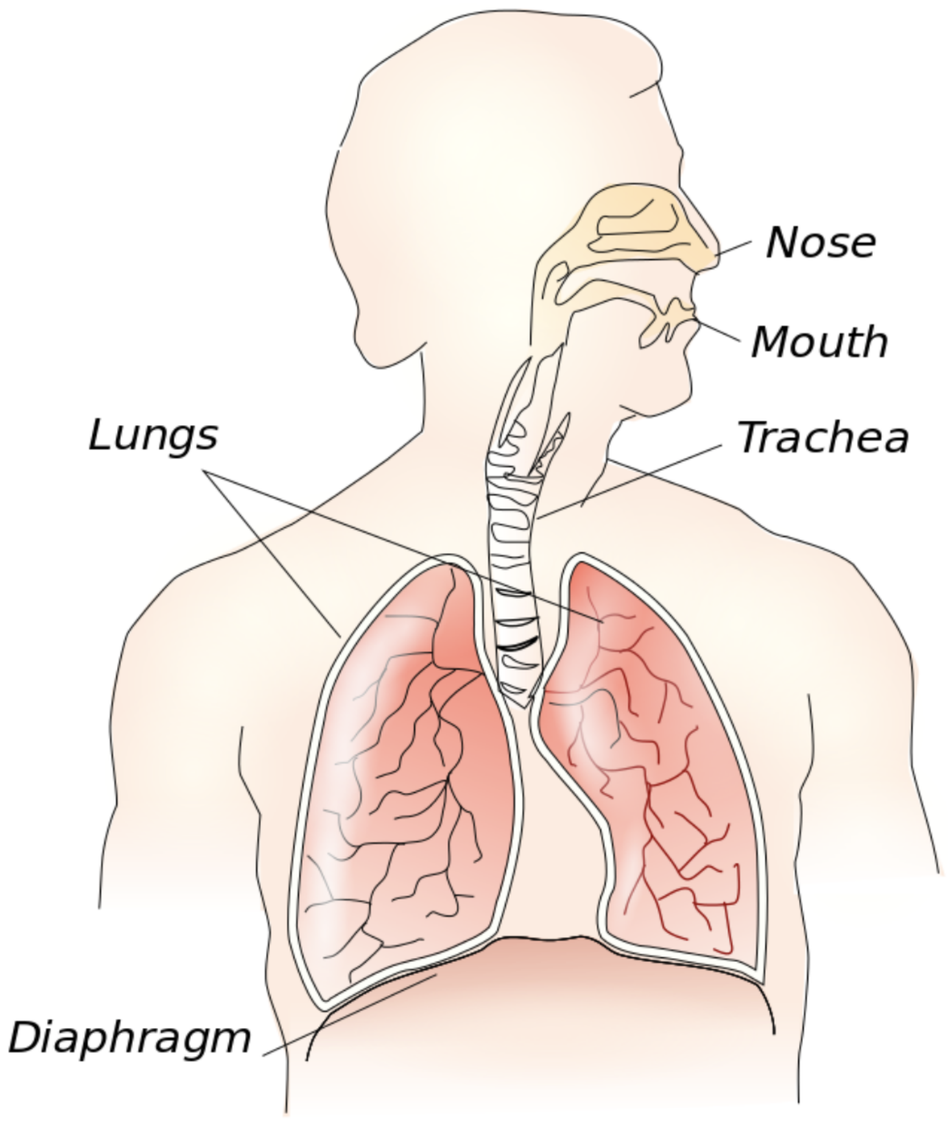
Marks - 25

Case study based questions

10th Science

Chemical Reactions and Equations

Passage - 1 **5 Marks**



We all know that we need energy to stay alive. We get this energy from the food we eat. During digestion, food is broken down into simpler substances. For example, rice, potatoes and bread contain carbohydrates. These carbohydrates are broken down to form glucose. This glucose combines with oxygen in the cells of our body and provides energy. The special name of this reaction is respiration

Q 1. State true or false: Respiration is an exothermic process.

(1) TRUE

(2) FALSE

Q 2. Which of the following is(are) example of an exothermic reaction?

(1) Respiration

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(2) Burning of natural gas
(3) The decomposition of vegetable matter into compost
(4) All of the above

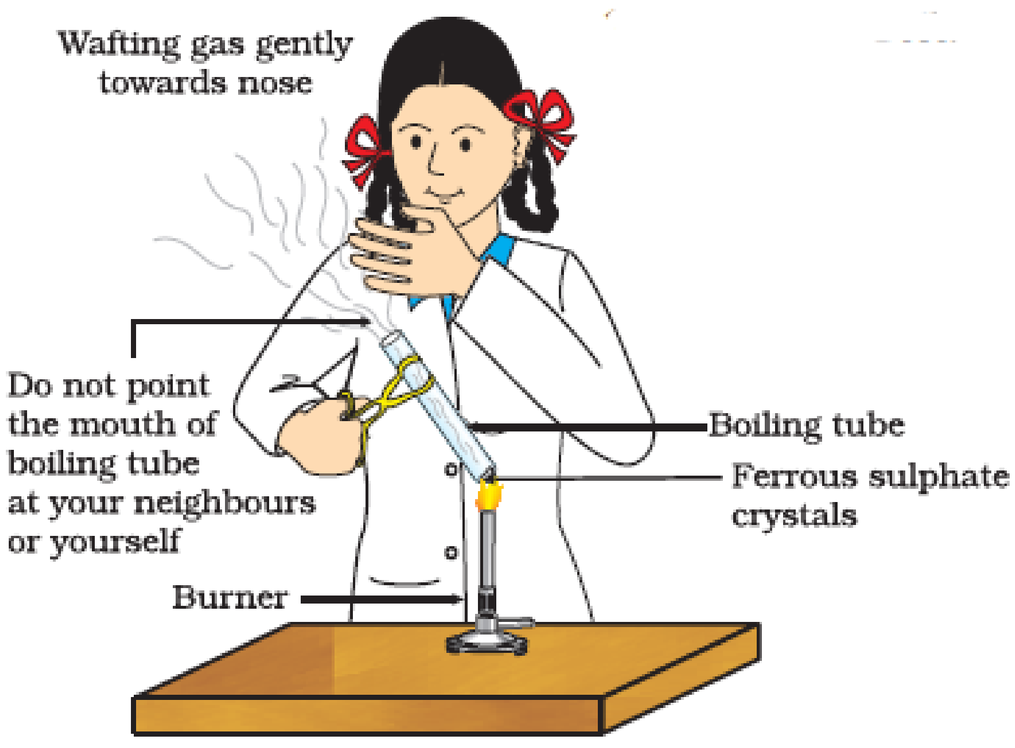
Q 3. Which of the following is (are) an endothermic process(es)?
(1) Dilution of sulphuric acid
(2) Sublimation of dry ice
(3) Condensation of water vapours
(4) Reaction of water with quick lime

Q 4. Which of the following is(are) reactant(s) in respiration?
(1) Oxygen
(2) Glucose
(3) Both (1) and (2)
(4) Water

Q 5. Which of the following is(are) product(s) in respiration?
(1) Water
(2) Carbon dioxide
(3) Both (1) and (2)
(4) Oxygen

Passage - 2

5 Marks



Worksheet 1.2

Marks - 25

In the above image, an experiment is being performed where 2 g ferrous sulphate crystals are taken in a dry boiling tube. The colour of the ferrous sulphate crystals is noted down. After that the boiling tube is heated over the flame of a burner and the colour of the crystal is noted down.Based on the above experiment answer the questions given below.

Q 1. What was the initial colour of the ferrous sulphate crystals ?

(1) Green
(2) White
(3) Brown
(4) Red

Q 2. What was the colour of the ferrous sulphate crystals after heating ?

(1) Green
(2) White
(3) Brown
(4) Red

Q 3. Which of the following type of reaction takes place inside boiling tube ?

(1) Decomposition reaction
(2) Percipitation reaction
(3) Displacement reaction
(4) Combination reaction

Q 4. Which of the following is not the type of a decomposition chemical reaction?

(1) Thermal
(2) Electrical
(3) Displacement
(4) Photo

Q 5. Ferrous sulphate crystals decomposes into which of the following compound(s) ?

(1) ferric oxide
(2) sulphur dioxide
(3) sulphur trioxide

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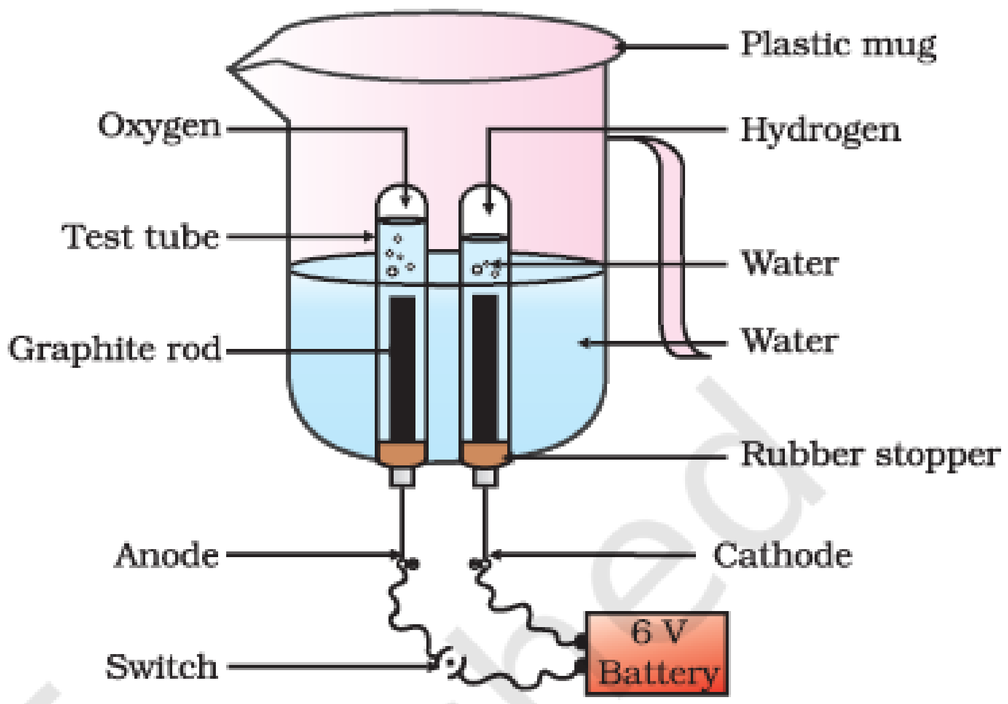
(4) All of the above

Passage - 3

5 Marks



In the above image, the electrolysis of water is performed. In electrolysis the electric current is used to decompose the compound into it's constituting compounds. During the electrolysis of water, the reaction involved is:
$2H_2O(l) \rightarrow 2H_2(g) + O_2(g)$

Q 1. The volume of gas collected at the cathode during the electrolysis of water is:
(1) same as the volume of gas collected at the anode
(2) half of the volume of gas collected at the anode
(3) double of the volume of gas collected at the anode
(4) double of the volume of gas collected at the anode

Q 2. During electrolysis, the charges carried by anode and cathode are respectively:
(1) each positive
(2) each negative
(3) positive, negative
(4) negative,positive

Q 3. The gas at which electrode will blow off the burning candle ?
(1) Cathode
(2) Anode

Worksheet 1.2

Marks - 25

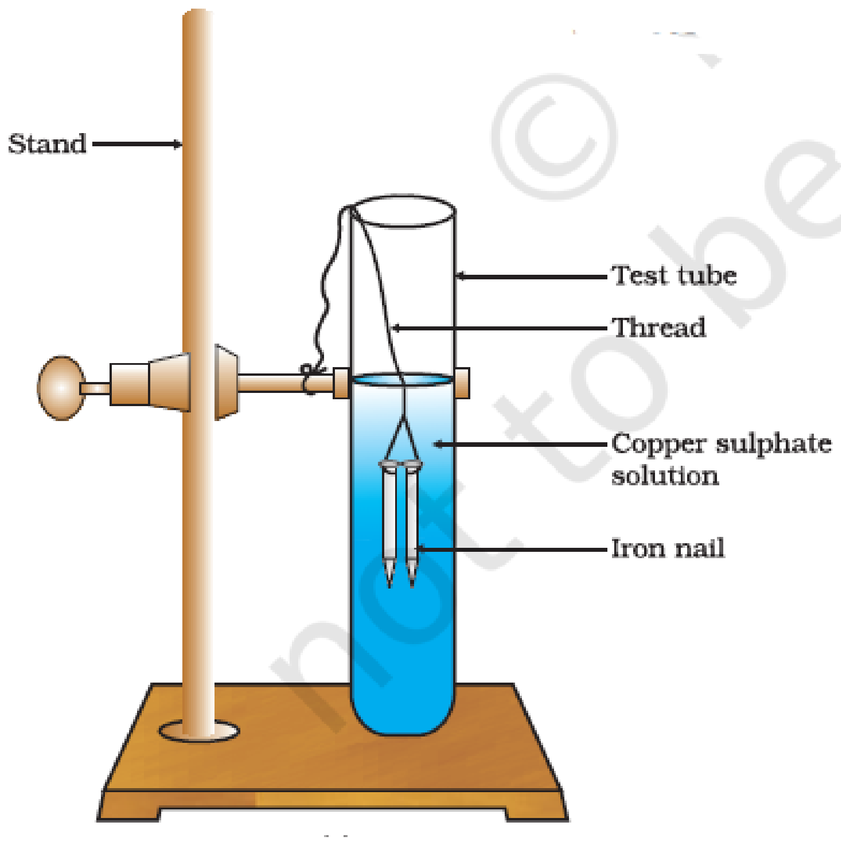
Q 4. Decomposition reaction can be carried out by which of the following?

(1) Heat
(2) Light
(3) Electricity
(4) All of the above

Q 5. How many types of decomposition reaction are there ?

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

Passage - 4 **5 Marks**



In the above image, two iron nails are taken and they are tied with a thread and immersed in a copper sulphate solution for about 20 minutes. After 20 minutes, iron nails are taken out from the copper sulphate solution . We observe that iron nail become brownish in colour and the blue colour of copper sulphate solution fades.

Q 1. Which of the following type of reaction takes place inside test tube ?

(1) Decomposition reaction
(2) Percipitation reaction

(3) Displacement reaction
(4) Combination reaction

Q 2. State true or false: In the above experiment Iron has displaced copper, from copper sulphate solution.
(1) TRUE
(2) FALSE

Q 3. Which of the following element(s) are more reactive than copper ?
(1) Iron
(2) Zlnc
(3) Lead
(4) All of the above

Q 4. State true or false: Iron is placed below copper in the reactivity series
(1) TRUE
(2) FALSE

Q 5. Which of the following is(are) the product(s) of the above reaction?
(1) Copper
(2) Ferrous sulphate
(3) Both (1) and (2)
(4) Iron

Passage - 5 **5 Marks**

In a redox reaction, both oxidation, as well as reduction, takes place together, oxidation involves loss of electrons while reduction involves the gain of electrons. The redox- reaction may involve a combination of atoms and molecules, displacement of metals, or non-metals.
Example: $Zn + CuSO_4 \rightarrow Cu + ZnSO_4$.

Worksheet 1.2

Marks - 25

Q 1. In the above equation, which of the following gets reduced?

(1) $CuSO_4$

(2) Zn

(3) $ZnSO_4$

(4) None of these

Q 2. The oxidising agent generally:

(1) loses the electrons

(2) gains the electron

(3) is in a gaseous state

(4) both b and c

Q 3. Identify the oxidising agent in the above reaction

(1) Copper

(2) Zinc

(3) Zinc Sulphate

(4) Copper Sulphate

Q 4. What is the type of the chemical reaction given in the above example?

(1) Double displacement reaction

(2) Displacement reaction

(3) Combination reaction

(4) Decomposition reaction

Q 5. Which among the following is(are) double displacement reaction(s)?

(1) $Pb + CuCl_2 \rightarrow PbCl_2 + Cu$

(2) $Na_2SO_4 + BaCl_2 \rightarrow BaSO_4 + 2NaCl$

(3) $C + O_2 \rightarrow CO_2$

(4) $CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$
