SHIKSHA CLASSES

Sub. : Science **Answer Paper** **Marks : 30**

Std. : Xth - CBSE **1. Chemical Reactions and Equations.** **Time : 1 Hour.**

SECTION (A) **(Each - 1 Mark)**

Q.1 : All the methods mentioned below can be used to prevent the food from getting rancid except :

I) Storing the food in the air-tight containers.

II) Storing the food in refrigerator.

III) Keeping the food in clean and covered containers.

IV) Always touching the food with clean hands.

Ans. : d) (iii) and (iv)

OR

The respiration process during which glucose undergoes slow combustion by combining with oxygen in the cells of our body to produce energy, is a kind of :

Ans. : a) Exothermic process

Q.2 : You are given the following chemical reaction. $CuO + H_2 \xrightarrow{Heat} Cu + H_2O$ **. Write the type of the reaction it represents.**

Ans. : The type of the reacton is Redox reaction as well as displacement reaction.

OR

A chemical reaction does not involve :

Ans. : d) Changing of the atoms of an element into of another element to form new products.

Q.3 : Assertion (A) : Colour of copper sulphate does not change when an iron nail is kept in it.

Reason (R) : Iron is more reactive than coper and it displaces it.

Ans. : d) A is false but R is true.

Q.4 : Assertion(A): Combustion reaction are also called exothermic oxidation reaction

Reason(R) : In these reaction oxygen is added and heat energy is released.

Ans. : a) Both A and R are true and R is correct explanation of the assertion.

Q.5 : Assertion (A) : Calcium carbonate when heated gives calcium oxide and water.

Reason (R) : On heating calcium carbonate, decomposition reaction takes place

Ans. : d) A is false but R is true.

Q.6 : The displacement reaction between iron (III) oxide and a metal X is used for welding the rail tracks. Here X is:

Ans. : d) Aluminium dust

OR

Give one example of a chemical reaction which is the combination of oxidation as well as combinaton reaction.

Ans. : Rusting of iron.

Q.7 : Read the following and answer any two questions from 5(i) to 5(iii) **(2 Mark)**

A rod of metal x is ---------- on the rod of metal.

i) Which is more reactive meal lead or metal x?

Ans. : b) Metal x

ii) Write the type of the given reaction.

Ans. : a) Displacement

iii) In the above reaction a thin layer of lead is deposited on the rod of metal x. Why?

Ans. : c) Both a and b

Q.8 : What type of chemical reactions take place when electricity is passed through water?

Ans. : c) Decomposition

Q.9 : Which of the following is true for an unbalanced chemical equation?

Ans. : d) Both (b) and (c)

Q.10 : In the following equation:

$Na_2CO_3 + xHCl \longrightarrow 2NaCl + CO_2 + H_2O$, the value of x is

Ans. : b)2

Q.11 : In writing chemical equations, inclusion of state symbols shall be done while

Ans. : c) The equation has been balanced

Q.12 : Which of the following statements about the given reaction are correct?

$3Fe\ (s) + 4H_2O\ (g) \rightarrow Fe_3O_4\ (s) + 4\ H_2\ (g)$

i) Iron metal is getting oxidized **ii) Water is getting reduced**

iii) Water is acting as reducing agent **iv) Water is acting as oxidising agent**

Ans. : c)(i), (ii) and (iv)

Q.13 : The process of reduction involves

Ans. : b)addition of hydrogen

Q.14 : Which of the following is a displacement reaction?

Ans. : b) $2Na + 2H_2O \rightarrow 2NaOH + H_2$

SECTION (B) **(Each - 2 Mark)**

Q.15 : Why a combustion reaction is an oxidation reaction?

Ans. : Combustion reaction is always carried out in the presence of air or oxygen therefore a combustion reaction is an oxidation reaction.

OR

: What do you mean by a precipitaion reaction? Explain by giving examples.

Ans. : A chemical reaction in which an insoluble substance (precipitate) is formed is called precipitaion reaction. Example is $Na_2SO_4 + BaCl_2 \longrightarrow BaSO_4\downarrow + 2NaCl$.

The white precipitate of $BaSO_4$ is formed by the reaction of SO_4^{2-} and Ba^{2+}.

Q.16 : Balance the following equation stepwise $Ag + HCl \longrightarrow AgCl \downarrow + H_2 \uparrow$

Ans. :

Element	Reactant	Product
Ag	1	1
H	1 × 2	2
Cl	1	1

$$Ag + 2HCl \longrightarrow AgCl\downarrow + H_2\uparrow$$

Element	Reactant	Product
Ag	1	1
H	2	2
Cl	2	1 × 2

$$Ag + 2HCl \longrightarrow 2AgCl\downarrow + H_2\uparrow$$

Element	Reactant	Product
Ag	1 × 2	2
H	2	2
Cl	2	2

$$2Ag + 2HCl \longrightarrow 2AgCl\downarrow + H_2\uparrow$$

Element	Reactant	Product
Ag	2	2
H	2	2
Cl	2	2

$\therefore$ Balanced reaction is

$$2Ag + 2HCl \longrightarrow 2AgCl\downarrow + H_2\uparrow .$$

SECTION (C) **(Each - 3 Mark)**

Q.17 : What is the colour of copper sulphate solution?What happens when iron nail is dipped in it?

Ans. : The colour of copper sulphate solution is dark blue.

When iron nail is dipped in it, its colour fades and becomes greenish. It happens due to the formation of greenish ferrous sulphate.

A Shiny brown coating of copper metal is seen on iron nail dipped in copper sulphate solution.

$$Fe_{(s)} + CuSO_{4(aq)} \longrightarrow FeSO_{4(aq)} + Cu_{(s)}$$

(Blue) (Green)

OR

: Explain redox reaction with the help of an example.

Ans. : A chemical reaction in which one substance is oxidised and the other is reduced simultameously is called a redox reaction.

All Oxidation - reduction reactions are redox reactions if occur simultaneously. In a chemical

reaction, a substance gets oxidised only when another substance is present, which gets reduced.

$$\overset{\text{Oxidation}}{\overbrace{}}\quad CuO + H_2 \longrightarrow Cu + H_2O \quad \underbrace{}_{\text{Reduction}}$$

Here CuO is losing oxygen, is being reduced. The hydrogen is gaining oxygen, is being oxidised.

Q.18: Write the balanced chemical reactions for the following reaction.

i) Process of photosynthesis. ii) Electric current is passed through water.

iii) Ammonia and hydrogen chloride gases are mixed.

Ans. : i) $6CO_{2(g)} + 6H_2O_{(l)} \xrightarrow{\text{Sunlight}} C_6H_{12}O_{6(s)} + 6O_{2(g)}$

ii) $2H_2O_{(l)} \xrightarrow{\text{Electrolysis}} 2H_{2(g)} + O_{2(g)}$ iii) $NH_{3(g)} + HCl_{(g)} \longrightarrow NH_4Cl_{(s)}$

SECTION (D) (5 Mark)

Q.19 : a) Define a balanced chemical equation. Why should an equation be balanced?

b) Write the balanced chemical equation for the following reaction :

I) Phosphorus burns in presence of chlorine to form phosphorus penta chloride.

II) Burning of natural gas.

III) the process of respiration.

Ans. : a) Balanced chemical equation has an equal number of atoms of different elements in the reactants and products. According to law of conservation of mass, matter can neither be created nor be destroyed in a chemical reaction.

b) i) $P_4(S) + 10Cl_2(g) \rightarrow 4PCl_5(S)$

ii) $CH_4(g) + 2O_2(g) \rightarrow CO_2(g) + 2H_2O(l) + \text{heat energy}$

iii) $C_6H_{12}O_6(S) + 6O_2(g) \rightarrow 6CO_2(aq) + 6H_2O(l)$.

OR

Consider the chemical equation given below and answer the question that follow.

$$CuO + H_2 \xrightarrow{\text{Heat}} Cu + H_2O$$

i) Name the substance which is getting oxidised. ii) Name the oxidising agent.

iii) Name the substance which is getting reduced. iv) Name the reducing agent.

v) What type of a reaction does this equation represent?

Ans. : i) The substance getting oxidised is H_2.

ii) CuO is the oxidising agent.

iii) The substance getting reduced is CuO.

iv) H_2 is the reducing agent.

v) Since oxidation and reduction is taking place simultaneously, this reaction is an example of redox reaction.

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