Multiple Choice Questions

1. **Which of the following is an example of endothermic process?**
   (a) Decomposition of vegetable matter into compost
   (b) Dissolution of ammonium chloride in water
   (c) Digestion of food in our body
   (d) Formation of slaked lime

2. **Balancing a chemical reaction follows:**
   (a) Law of Multiple proportions
   (b) Law of Conservation of mass
   (c) Law of definite proportions
   (d) Law of Reciprocal proportions

3. **Which metal is displaced when lead is put in the solution of copper chloride?**
   (a) Chlorine
   (b) Copper
   (c) Lead
   (d) All of these

4. **In the electrolysis of water, if the mass of the gas collected at the anode is m_a and the mass of the gas collected at the cathode is m_c, the value of (m_c/m_a) is:?**
   (a) 8
   (b) 1/16
   (c) 16
   (d) 1/8

5. **An iron nail was kept immersed in an Aluminium Sulphate solution. After about an hour, It was observed that:?**
   (a) The colourless solution changes to light green
   (b) The solution becomes warm
   (c) The solution remains colourless and no deposition is observed on iron nail
   (d) grey-metal is deposited on the iron nail

6. **Which of the reaction is used in black and white photography?**
   (a) Combination reaction
   (b) Decomposition reaction
   (c) Displacement reaction
   (d) Oxidation reaction

7. **The balanced chemical equation showing reaction between quicklime and water is?**
   (a) $CaO + H_2O \rightarrow Ca(OH)_2 + H_2 + Heat$
   (b) $CaO + H_2O \rightarrow Ca(OH)_2 + Heat$
   (c) $2CaO + H_2O \rightarrow 2CaOH + H_2 + Heat$
   (d) $2CaO + 3H_2O \rightarrow 2Ca(OH)_3 + O_2 + Heat$

8. **Which atom is reduced when any element E is burnt in air –**
   (a) Oxygen
   (b) Nitrogen
   (c) Argon
   (d) Radon

9. **In order to balance the following chemical equation, the values of the coefficients x and y respectively are ?**

$$x\ Pb(NO_3)_2 \xrightarrow{Heat} 2\ PbO + y\ NO_2 + O_2$$

(a) 2, 4 (b) 2, 3
(c) 2, 2 (d) 4, 2

10. **Identify the correct statement about the following reaction:**

$2H_2S + SO_2 \longrightarrow 2H_2O + S$

(a) H_2S is reduced to sulphur
(b) SO_2 is oxidised to sulphur.
(c) SO_2 is oxidising agent and H_2S is reducing agent.
(d) H_2S is oxidising agent and SO_2 is reducing agent.

Fill in the blanks :

11. The formation of a white Precipitate in a reaction is an example of a _____ reaction.

12. The Reaction in which heat is released is called _____ reaction.

True / False

13. Photosynthesis is an endothermic reaction.

14. Burning of candle is both Physical and chemical change.

Very Short Type Questions

15. Write an activity in support of a combination reaction.

16. Identify the reducing agent in the following reaction:

$Fe_2O_3 + 3CO \rightarrow 2Fe + 3CO_2$

Short Type Questions

17. Convey the following information in the form of chemical equation :"An aqueous solution of ferrous sulphate reacts with an aqueous solution of sodium hydroxide to form a precipitate of ferrous hydroxide and sodium sulphate remains in solution".

18. Translate the following statement into a chemical equation and then balance it : Barium chloride reacts with aluminium sulphate to give aluminium chloride and a precipitate of barium sulphate.

Essay Type Questions

19. A solid substance P which is very hard and is used in the construction of many buildings, especially flooring.
When substance P is heated strongly, it decomposes to form another solid Q and a gas R is given out. Solid Q reacts with water with the release of a lot of heat to form a substance S. When gas R is passed into a clear solution of substance S, then a white precipitate of substance T is formed. The substance T has the same chemical composition as starting substance P

i. What is substance P? Write its common name as well as chemical formula.
ii. What is substance Q?
iii. What is gas R?
iv. What is substance S? What is its clear solution known as?
v. What is substance T? Name any two natural forms in which substance T occurs in nature?

20. **You are provided with the following substances :**

a. Iron Nails
b. $CuSO_4$ solution
c. $BaCl_2$
d. Cu powder
e. Ferrous sulphate crystals
f. Quick lime

Make any five reactions using these substances.

HOTS

21. **Assertion (A) :** Magnesium burns with a dazzling white flame in air.
Reason (R) : Magnesium reacts with nitrogen in the air to form magnesium nitride.

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

1. **(b)**
Dissolution of ammonium chloride in water is an endothermic reaction.

2. **(b)**
Balancing a chemical reaction follows the law of conservation of mass. According to the Law of Conservation of Mass, mass can neither be created nor destroyed in a chemical reaction. To obey this law, the total mass of elements present in reactants must be equal to the total mass of elements present in products.

3. **(b)** Copper

4. **(d)** 1/8

5. **(c)**
No reaction takes place because iron is less reactive than aluminium. It cannot displace Al from its salt solution.

6. **(b)** Decomposition reaction

7. **(b)** $CaO + H_2O \rightarrow Ca(OH)_2 + Heat$

8. **(a)**
Oxidation is the process of being oxidized. A substance is said to be oxidized when it loses electrons to the oxidizer or gains oxygen atoms. The oxidizer is the substance that oxidizes. The most common oxidizer is Oxygen. Since it is so abundant, we naturally understood oxygen to be required for burning.
When things burn, they get oxidized. Complex molecules get reduced to simpler ones. For example, wood on combustion will give carbon dioxide and water as its main products. E is oxidized and oxygen is reduced.

9. **(a)** 2, 4

10. **(c)**
SO_2 is oxidising agent and H_2S is reducing agent.
In this reaction, sulfur dioxide loses an oxygen atom and is reduced to sulfur, while hydrogen sulfide gains an oxygen atom and is oxidized to water.

11. **Fill in the blank :** Precipitation

12. **Fill in the blank :** Exothermic

13. **True and False :** False

14. **True and False :** True

15. Reactions in which two or more reactants combine to form one product are called combination reaction.

A general combination reaction can be represented by the chemical equation given here. $A + B \rightarrow AB$

Hold a piece of clean Mg wire with a pair of tongs and heat it over a Bunsen flame. It is seen that the wire burns with a dazzling light and forms a white powder. The white powder is MgO.

$2Mg + O_2 \rightarrow 2MgO$.

16. Carbon monoxide is the reducing agent because it removes oxygen from Fe_2O_3 and causes its reduction and itself gets oxidized.

17. When an aqueous solution of ferrous sulphate reacts with an aqueous solution of sodium hydroxide to form a precipitate of ferrous hydroxide and sodium sulphate remains in solution the reaction is as follows:

$FeSO_4(aq) + 2NaOH(aq) \rightarrow Fe(OH)_2 + Na_2SO_4(aq)$.

18. Barium chloride reacts with aluminium sulphate to give aluminium and separates Barium sulfate($BaSO_4$).

$3BaCl_2(aq) + Al_2(SO_4)_3(aq)$

$\downarrow$

$2AlCl_3(aq) + 3BaSO_4(s) \downarrow$

19.

i. The substance P is Calcium carbonate. It's common name is limestone and it's chemical formula is $CaCO_3$.

ii. Substance Q is calcium oxide, CaO.

iii. The gas R is Carbon dioxide, CO_2.

iv. The substance S is Calcium hydroxide, $Ca(OH)_2$; its clear solution is known as Lime water.

v. The substance T is Calcium carbonate; Two natural forms are limestone and marble.

20.

a. $BaCl_2(aq) + CuSO_4(aq)$

$\downarrow$

$BaSO_4(s) + CuCl_2(aq)$

b. $2Cu(s) + O_2(g) \rightarrow 2CuO(s)$

c. $2FeSO_4(s) \xrightarrow{Heat} Fe_2 + SO_2 + SO_3$

d. $FeSO_4.7H_2O \xrightarrow{Heat} Fe_2O_3(s) + SO_2 + 7H_2O$

e. $CaO(s) + H_2O \rightarrow Ca(OH)_2(s) + Heat$

21. (b)

The dazzling flame is due to magnesium burning in oxygen, not nitrogen.

Magnesium nitride does form but it's not the main cause of the flame