## Chapter - (Chemical Reactions And Equations)

## Topic - 1 (Chemical Reactions And Equations)

**Very Short Answer Type Questions**

Q.1. What is meant by a chemical reaction?

Q.2. Which one is a chemical change-rusting of iron or melting of iron?

Q.3. Name and state the law which is kept in mind while we balance a chemical equation.

Q.4. State one basic difference between a physical change and a chemical change.

Q.5. What happens when quick lime is added to water?

Q.6. What happens when $ZnCO_3$is heated in the absence of air? Give the relevant equation.

Q.7. Is burning of a candle, a physical change or a chemical change?

Q.8. Write a balanced chemical equation: $FeSO_4(s) \xrightarrow{Heat} Fe_2O_3(s) + SO_2(g) + SO_3(g)$

Q.9. Write the chemical equation for reactions that takes place when lead nitrate and potassium iodide solutions are mixed.

Q.10. Write a balanced chemical equation for the following reaction.

Ethanol is warmed with ethanoic acid to form ethyl acetate in the presence of concentrated $H_2SO_4$.

**Short Answer Type Questions – I**

Q.1. List four observations that help us to determine whether a chemical reaction has taken place.

Q.2. (i) State the law which is followed in balancing a chemical equation.

(ii) Balance the following chemical equation: $Fe + H_2O \longrightarrow Fe_3O_4 + H_2$

Q.3. What is observed when carbon dioxide gas is passed through lime water.

(i) For a short duration

(ii) For long duration? Also write the chemical equations for the reaction involved.

Q.4. A copper plate was dipped into a solution of silver nitrate. After sometime, a black layer was observed on the surface of copper plate. State the reason for it and write chemical equation of the reaction involved.

Q.5. When iron rod is kept dipped in copper sulphate solution for some time, a brown coating is formed on the iron rod. What change will be observed in the colour of the solution? Also write chemical equation for the reaction involved.

Q.6. When hydrogen gas is passed over heated copper (II) oxide, copper and steam are formed. Write the balanced chemical equation with physical states for this reaction. State what kind of chemical reaction is this?

Q.7. Write the skeletal equation for the following reactions:

(i) Hydrogen sulphide reacts with sulphur dioxide to form sulphur and water.

(ii) Methane on burning combines with oxygen to produce carbon dioxide and water.

What is the need of balance equations?

Q.8. Translate the following statement into chemical equation and then balance it: "A metal in the form of ribbon burns with a dazzling white flame and changes into a white powder.'

Q.9. State what happens when zinc granules are heated with sodium hydroxide solution. Write the balanced chemical for the reaction. Name the main product formed in this reaction.

Q.10. Balance the following chemical equations:

(i) $NaOH + H_2SO_4 \longrightarrow Na_2So_4 + H_2O$

(ii) $BaCl_2 + Na_2SO_4 \longrightarrow BaSO_4 + NaCL$

Q.11. Give reaction of calcium and magnesium with dilute nitric acid.

Q.12. write balanced chemical equations for the following reactions:

(i) Silver bromide on exposure to sunlight decomposes into silver and bromine.

(ii) Sodium metal reacts with water to form sodium hydroxide and hydrogen gas.

Q.13. In a test-tube, hydrochloric acid is poured over a few zinc granules. List two observations that suggest that a chemical reaction has occurred.

$2HCL + Zn \longrightarrow ZnCl_2 + H_2$

Q.14. Convert the following statements into balanced chemical equations:

(i) Zinc reacts with sulphuric acid to form zinc sulphate and hydrogen gas.

(ii) Magnesium burns in oxygen to form magnesium oxide.

**Short Answer Type Questions – II**

Q.1. Define a chemical reaction. Which observation help you to determine whether a chemical reactions has taken palace?

Q.2. Define the term decomposition reaction. Give one example each of thermal each of thermal decomposition and electrolytic decomposition.

Q.3. Write the steps for balancing the chemical equation for the formation of ammonia by the combination of nitrogen and hydrogen.

Q.4. (a) Mention the four informations given by an equations.

(b) State the law of conservation of mass as applicable in a chemical reactions.

Q.5. When a copper wire was left in silver nitrate solution for sometime, it was observed that the solution turned bluish green.

(i) Explain the observation.

(ii) write the balanced chemical equation to represent the change taking place.

Q.6. 2 g ferrous sulphate crystals are heated in a dry boiling tube.

(i) list any two observations.

(ii) Name the type of chemical reaction taking palace.

(iii) write the chemical equation of the reaction .

Q.7. (a) In the following reactions, name the reactants, which undergo oxidation and reduction :

(i) $CuO(s) + H_2(g) \longrightarrow Cu(s) + H_2O(g)$

(ii) $CuO(s) + Zn(s) \longrightarrow ZnO(s) + Cu(s)$

(b) State one industrial application of reduction .

Q.8.(a) write chemical reactions.

(i) when carbon dioxide gas is passed through time water.

(ii) when excess of carbon dioxide gas is passed through lime water.

(b) list two natural forms of calcium carbonate.

Q.9. identify the type of each of the following reactions. Also write balanced chemical equations for each.

(i) the reaction mixture becomes warm.

(ii) An insoluble substances is formed.

Q.10. (i) Solution of a substance 'x' is used for testing carbon dioxide. Write the equation of the reaction of 'x' with carbon dioxide.

(ii) How is 'x' obtained ? write chemical equation.

Q.11. what happens when:

(i) Dilute hydrochloric acid is added to solid sodium carbonate.

(ii) Quicklime is treated with water.

(iii) Sodium chloride solution is added to lead nitrate solution.

Also write the chemical equation in each case.

Q.12. write the chemical equation of the reaction with an example each in which the following change has taken palace :

(i) Change in colour

(ii) Change in temperature

(iii) formation of precipitate.

Q.13. Complete and balance the following chemical equations :

(i) $CaCO_3$ + HCL

(ii) AL + HCL

(iii) $MnO_2$ + HCL

Q.14. write balanced chemical equations for the following reactions :

(i) dilute sulphuric acid reacts with aluminum powder .

(ii) dilute hydrochloric acid reacts with sodium carbonate.

(iii) Carbon-dioxide is passed through lime water.

Q.15. Balance the following chemical equations and state whether they are exothermic or endothermic:

(i) $Na + H_2O \longrightarrow NaOH + H_2$

(ii) $FeSO_4 \longrightarrow Fe_2O_3 + SO_2 + SO_3$

Q.16. Write the chemical equations involved in the following chemical reactions:

(i) White Washing.

(ii) Black and white photography.

Q.17. 2 g of ferrous sulphate crystals are heated in a boiling tube.

(i) state the colour of ferrous sulphate crystal both before heating and after heating.

(ii) Name the gases produced during heating.

(iii) write the chemical equation for the reaction.

**Long Answer Type Questions**

Q.1. Define a chemical reaction. State four observation which help us to determine that a chemical reaction as taken palace . Write one example of each observation with a balanced chemical equations.

Q.2. Write balanced chemical equations for the following statements :

(i) Bleaching powder is kept open in air.

(ii) Blue crystals of copper sulphate are heated.

(iii) Chlorine gas is passed through dry slaked lime.

(iv) Carbon dioxide gas is passed through lime water.

(v) NaOH solution is heated with zinc granules.

Q.3. identify the type of chemical reaction in the following statements and define each of them :

(i) Digestion of food in our body

(ii) Rusting of iron

(iii) Heating of manganese dioxide with aluminum powder

(iv) Blue colour of copper sulphate solution disappears when iron filing are added to it

(v) Dilute hydrochloric acid is added to sodium hydroxide solution to form sodium chloride and water

Q.4. Write balanced chemical equation for the following statement :

(i) NaOH solution is heated with zinc granules.

(ii) Excess of carbon dioxide gas is passed through lime water.

(iii) Dilute sulphuric acid reacts with sodium carbonate

(iv) Egg shells are dropped in hydrochloric acid.

(v) Copper (II) oxide reacts with dilute hydrochloric acid.

Q.5 (a) list any three observation which determine that a chemical reactions has taken place. Also list three information that cannot be obtained about a chemical reaction, merely by its chemical equation.

(b) Balance the following chemical equations.

(i) $Fe + H_2O \longrightarrow Fe_3O_4 + H_2$

(ii) $CO_2 + H_2O \longrightarrow C_6H_{12}O_6 + O_6$

Q.6. What happens when zinc granules are treated with dilute solutions of $H_2SO_4$, HCL, $HNO_3$, NaCL and NaOH ? Also write the chemical equation.

## Topic - 2 (Types of Chemical Reactions-Corrosion And Rancidity)

### Very Short Answer Type Questions

Q.1. Why are decomposing reactions called the opposite of combination reactions ?

Q.2. Why is photosynthesis considered an endothermic reaction ?

Q.3. State the type of chemical reaction used for the extraction of metals from their naturally occurring chlorides of oxides.

Q.4. Why is hydrogen peroxide kept in coloured bottles ?

Q.5. $N_2 + 3H_2 \longrightarrow 2NH_3$, name the type of reaction.

Q.6. Why do silver articles become black after something when exposed to air ?

Q.7. Give reasons why do chips manufacturers usually flush bags of chips with gas such as nitrogen ?

Q.8. Identify the substances that is oxidized and substances that is reduced in the reaction.

$CuO(s) + H_2(g) \longrightarrow Cu(s) + H_2O(I)$

Q.9. write a balanced chemical equation for a chemical combination reaction .

Q.10. Give an example of a double displacement reaction.

Q.11. Identify the reducing agent in the following reaction :

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

### Short Answer Type Questions – I

Q.1. What is the combination reaction ? State one example giving balanced chemical equation for the reaction.

Q.2. (i) $3Pbo + C \longrightarrow 2Pb + CO_2$

(ii) $MnO_2 + 4HCL \longrightarrow MnCL_2 + 2H_2O + CL_2$

What is redox reaction ? identify the substance oxidided and the substance reduced in the above reactions.

Q.3. Identify the type of reaction from the following equation and define it.

$CH_4 + 2O_2 \longrightarrow CO_2 + 2H_2O$ + heat.

Q.4. why does the colour of copper sulphate solution change when iron nail is dipped in it ? Write chemical equation for the reaction involved.

Q.5. State reason for the following :

(i) Potato chips manufacturing fill the packet of chips with nitrogen gas.

(ii) Iron articles are shining when new, but get coated with a reddish brown powder, when left for some time.

Q.6. (i) List any two changes which take palace when oily food gets oxidized.

(ii) Mention a measure which prevents or slows down its oxidation.

Q.7. A student prepares aqueous solutions of the following salts :

Copper sulphate , ferrous sulphate, sodium sulphate, barium chloride.

Write the colour of each solution thus formed.

Q.8. Mention the colour of $FeSO_4.7H_2O$ crystals. How does the colour change upon heating ? Give balanced chemical equation for the change.

Q.9. Write balanced equation for the reaction between magnesium and hydrochloric acid. Name the product obtained, identify the type of reaction.

Q.10. Identify the type of reaction from the following equations :

(i) $CH_4 + 2O_2 \longrightarrow CO_2 + 3H_2O$

(ii) $Pb(NO_3)_2 + 2KL \longrightarrow PbL_2 + 2KNO_3$

(iii) $CaO + H_2O \longrightarrow Ca(OH)_2$

(iv) $CuSO_4 + Zn \longrightarrow ZnSO_4 + Cu$

Q.11. Barium chloride reacts with aluminum sulphate to give aluminum chloride and barium sulphate.

(i) State the two types in which the above reaction can be classified.

(ii) Translate the above statement into a chemical equation.

Q.12.When hydrogen gas is passed over heated copper (II) oxide, copper and steam are formed. Write the balanced chemical equation for this reaction and state (i) the substances oxidized and reaction and (ii) the substances reduced in the reaction.

Q.13.Write the balanced chemical equation for the following reaction and define it. Iron III oxide reacts with aluminum and gives molten iron and aluminum oxide'.

Q.14. Identify the oxidizing agents (oxidants) in the following reactions :

(i) $Pb_3O_4 + 8HCL \longrightarrow 3PbCL_2 + CL_2 + 4H_2O$

(ii) $CuSO_4 + Zn \longrightarrow Cu + ZnSO_4$

Q.15. A silver article generally turns black when kept in the open for a few days. The articles when rubbed with toothpaste again start shining.

(i) why do they turn black ? Name the phenomenon involved.

(ii) Name the black substances formed and write its formula.

**Short Answer Type Questions – II**

Q.1. What is rancidity ? Mentation any two ways by which rancidity can be prevented.

Q.2. what is meant by a precipitation reaction ? Explain by giving an example. Also give a balanced chemical equation for the reaction stating the states of the reactants and the products formed.

Q.3. Name the term used to indicate the development of unpleasing smell and taste in fat and oil containing food due to oxidants ? why are they added to fat and oil containing food.

Q.4. A solution of copper sulphate was kept in an iron pot. After few days, the iron pot was found to have a number of holes in it. Explain the reaction with the help of a chemical equation.

Q.5. Some articles made of silver, copper and iron get coloured coating over them when they are exposed to air. Identify the colour and chemical name of the substances of coating in each case.

Q.6 Write one equation each for decomposition reactions where energy is supplied in the form of heat, light and electricity.

Q.7. Write balanced equation for the following reactions and also name the type of chemical reaction in each case:

(i) Magnesium ribbon is burnt in air.

(ii) lime stone is heated.

Q.8. Select (i) combination reaction (ii) decomposition reaction and (ii) displacement reaction from the following chemical equations :

(i) $ZnCO_3(s) \longrightarrow ZnO(s) + CO_2(g)$

(ii) $Pb(s) + CuCL_2(aq) \longrightarrow PbCL_2(aq) + Cu(s)$

(iii) $NaBr(aq) + AgNO_{3(aq)} \longrightarrow AgBr(s) + NaNO_3(aq)$

(iv) $H_2(g) + Cl(g) \longrightarrow 2HCL(g)$

(v) $Fe_2O_3(g) + 2AL \longrightarrow AL_2O_3 + 2Fe(s)$

(vi) $3H_2(g) + N_2(g) \longrightarrow 2NH_3(g)$

Q.9. State the kind of chemical reactions in the following examples :

(i) Digestion of food in stomach

(ii)Combustion of coal in air

(iii) Heating of limestone.

Q.10. Name two metals which do not corrode easily. Give an example in each of the following case to support that :

(i) Corrosion of some metals is an advantage.

(ii) Corrosion of a metal is a serious problem.

Q.11. When is a chemical reaction considered a double displacement reaction ? Explain giving example. State a difference between displacement and double displacement reaction.

Q. 12. Differentiate between a combination reaction and a decomposition reaction. Write one chemical equation each for these reaction.

Q.13. The following diagram displays a chemical reaction. Observe carefully and answer the following questions :

(i) Identify the type of chemical reaction that will take place and define it. How will the colour of the salt change?

(ii) Write the chemical equation of the reaction that take place.

(iii) Mention one commercial use of this salt.

Q.14. In the electrolysis of water:

i.) Name the gas collected at the cathode and anode respectively.

ii.) Why is the volume of one gas collected at one electrode is double than that at the other ? Name this gas.

iii) How will you test the evolved gases ?

Q.15. Name the salts that are used in black and white photography. Give reactions when they are exposed to light. Define the type of chemical reaction taking place.

Q.16. A small amount of calcium oxide is taken in a beaker and water is added slowly to it.

(i) Will there be any change in temperature of the contents ? Explain.

ii) Name and define the type of reaction taking place.

iii) Write chemical equation for the above reaction.

Q.17. 2 g of lead nitrate powder is taken in a boiling tube. The boiling tube is heated over a flame. Now answer the following :

(i) State the colour of the fumes evolved and the residue left.

(ii) Name the type of chemical reaction that has taken place, stating its balanced equation.

Q.18. When food containing fat or oil is not used and left for a long time, their smell and taste changes. Name the process which is responsible for this change. List two methods to prevent or slow down the above change.

Q.19. Differentiate between an exothermic reaction and an endothermic reaction. Write one example for each one of these reaction in the form of balanced chemical equation.

Q.20. "Combination reaction is the reverse of decomposition reaction." Justify the statement with the help of appropriate chemical equation of each.

Q.21. In the following chemical reaction "zinc oxide reacts with carbon to produce zinc metal and carbon monoxide."

$$ZnO + C \longrightarrow Zn + CO$$

i.)Identify the substance getting oxidised and the one getting reduced.

ii.) State the reason for choosing the substances in (i).

iii.) Name the type of reaction and give another example of similar type of reaction.

Q.22. (i) Give an example for combination reaction which is exothermic.

(ii) Identify the oxidizing agent, reducing agent in the following reaction :

$$H_2s + CL_2 \longrightarrow 2HCL + S$$

iii) Name the phenomenon due to which the taste and smell of oily food changes when kept for a long time in open. Suggest one method to prevent it.

Q.23. Write balanced chemical equation for the reactions that take place during respiration. Identify the type of combination reaction that takes place during this process and justify the name. Give one more example of this type of reaction.

**Long Answer Type Questions**

Q.1. (i) Define corrosion.

ii.) What is corrosion of iron called?

iii.) How will you recognise the corrosion the silver?

iv) Why corrosion of iron is serious problem?

v) How can we prevent corrosion of iron?

**OR**

(i) Define corrosion, what name is given to the corrosion of iron?

(ii) Name the colour of coating formed on silver and copper articles, when exposed to air?

(iii) List two damages caused by corrosion and suggest how corrosion can be prevented.

Q.2. (a) Explain the term "rancidity."

N0ame the type of chemical reaction responsible for causing rancidity and define it.

(b) Write three methods for preventing rancidity of food.

Q.3. (a) Most of the metals acquires a dull surface when exposed to air. Name the chemical phenomenon responsible for the process.

(b) State the conditions under which the iron articles get rusted. Design an activity to investigate the conditions necessary for rusting. Suggest any two methods to prevent rusting of iron.

Q.4.(a) Write one equation each for decomposition reaction when energy is supplied in the form of:

(i) heat, (ii) light

(b) Account of the following :

(i) Paint is applied on iron articles.

(ii) Oil and fat containing food items are flushed with nitrogen.

(iii) When an iron nails kept in copper sulphate solution, blue colour of the solution fades and iron nails becomes brownish.

Q.5. (i) Account for the following :

(a) White silver chloride turns grey in sunlight.

(b) Brown coloured copper powder on heating in air turns into black coloured substances.

(ii) What do you mean by :

(a) Displacement reaction

(b) Reduction reaction

(c) Combination reaction?

Write balanced chemical equation.

Q.6. (i) Solid calcium oxide was taken in a container and water was added slowly to it:

(a) Write the observation,

(b) Write the chemical formula of the product formed.

(ii) What happens when carbon dioxide gas is bubbled through lime water

(a) In small amount,

(b) In excess?

(iii) Why do you apply paint on iron articles?

Q.7 (i) What happens chemically when quick lime is added to water?

(ii) Balance the following chemical equation

$MnO_2 + HCl \longrightarrow MnCl_2 + Cl_2 + H_2O$

(iii) What is decomposition reaction? Explain it with suitable example.