CLASS 10 CHEMISTRY PREVIOUS YEAR QUESTIONS
CHEMICAL REACTIONS AND EQUATIONS

Question 1. Identify 'x', 'y' and 'z' in the following reaction :

$$2KClO_{3(x)} \xrightarrow{y} 2KCl_{(x)} + O_{2(z)}$$

(a) x = gas; y = reaction condition; z = gas
(b) x = solid; y = liquid; z = gas
(c) x = number of moles of $KClO_3$; y = reaction condition; z = number of molecules of oxygen
(d) x = physical state of $KClO_3$ and KCl;
y = reaction condition, z = physical state of O_2. (2020)

Question 2. Assertion (A) : Following is a balanced chemical equation for the action of steam on iron : $3Fe + 4H_2O \rightarrow Fe_3O_4 + 4H_2$
Reason (R): The law of conservation of mass holds good for a chemical equation.
(a) Both (A) and (R) are true and reason (R) is the correct explanation of the assertion (A)
(b) Both (A) and (R) are true, but reason (R) is not the correct explanation of the assertion (A).
(c) (A) is true, but (R) is false.
(d) (A) is false, but (R) is true. (2020)

Question 3. (a) State the law that is followed by balancing a chemical equation.
(b) Balance the following chemical equation: $Na + H_3O \rightarrow NaOH + H_2$ (Board Term I, 2013)

Question 4. Explain the significance of photosynthesis.
Write the balanced chemical equation involved in the process. (Board Term I, 2017)

Question 5. Write balanced chemical equations for the following chemical reactions:
(a) Hydrogen + Chlorine → Hydrogen chloride
(b) Lead + Copper chloride → Lead chloride + Copper
(c) Zinc oxide + Carbon → Zinc + Carbon monoxide (Board Term I, 2014)

Question 6. Calcium oxide reacts vigorously with water to produce slaked lime.
$CaO_{(s)} + H_2O_{(l)} \rightarrow Ca(OH)_{2(aq)}$
This reaction can be classified as
(A) Combination reaction
(B) Exothermic reaction
(C) Endothermic reaction
(D) Oxidation reaction
Which of the following is a correct option? (2020)
(a) (A) and (C)
(b) (C) and (D)
(c) (A), (C) and (D)
(d) (A) and (B)

Question 7. When hydrogen sulphide gas is passed through a blue solution of copper sulphate, a black precipitate of copper sulphide is obtained and the sulphuric acid so formed remains in the solution. The reaction is an example of a (2020)
(a) combination reaction
(b) displacement reaction
(c) decomposition reaction

(d) double displacement reaction.

Question 8. In a double displacement reaction such as the reaction between sodium sulphate solution and barium chloride solution :
(A) exchange of atoms takes place
(B) exchange of ions takes place
(C) a precipitate is produced
(D) an insoluble salt is produced
The correct option is (2020)
(a) (B) and (D)
(b) (A) and (C)
(c) only (B)
(d) (B), (C) and (D)

Question 9. In which of the following, the identity of initial substance remains unchanged? (2020)
(a) Curdling of milk
(b) Formation of crystals by process of crystallisation
(c) Fermentation of grapes
(d) Digestion of food

Question 10. Study the following equation of a chemical reaction: (Board Term 1, 2015)
$H_2 + Cl_2 \rightarrow 2HCl$
(i) Identify the type of reaction.
(ii) Write a balanced chemical equation of another example of this type of reaction.

Question 11. State the type of chemical reactions, represented by the following equations : (Board Term I, 2014)
(a) $A + BC \rightarrow AC + B$
(b) $A + B \rightarrow C$
(c) $PQ + RS \rightarrow PS + RQ$
(d) $A_2O_3 + 2B \rightarrow B_2O_3 + 2A$

Question 12. 1 g of copper powder was taken in a China dish and heated. What change takes place on heating? When hydrogen gas is passed over this heated substance, a visible change is seen in it. Give the chemical equations of reactions, the name and the colour of the products formed in each case. (2020)

Question 13. A compound 'A' is used in the manufacture of cement. When dissolved in water, it evolves a large amount of heat and forms compound 'B'.
(i) Identify A and B.
(ii) Write chemical equation for the reaction of A with water.
(iii) List two types of reaction in which this reaction may be classified. (2020)

Question 14. Mention with reason the colour changes observe when:
(i) silver chloride is exposed to sunlight.
(ii) copper powder is strongly heated in the presence of oxygen.
(iii) a piece of zinc is dropped in copper sulphate solution. (2020)

Question 15. Lead nitrate solution is added to a test tube containing potassium iodide solution.
(a) Write the name and colour of the compound precipitated.
(b) Write the balanced chemical equation for the reaction involved.

(c) Name the type of this reaction justifying your answer. (2020)

Question 16. 2 g of silver chloride is taken in a China dish and the China dish is placed in sunlight for sometime. What will be your observation in this case? Write the chemical reaction involved in the form of a balanced chemical equation. Identify the type of chemical reaction. (Delhi 2019)

Question 17. Identify the type of reactions taking place in each of the following cases and write the balanced chemical equation for the reactions.
(a) Zinc reacts with silver nitrate to produce zinc nitrate and silver.
(b) Potassium iodide reacts with lead nitrate to produce potassium nitrate and lead iodide. (Delhi 2019)

Question 18. 2 g of ferrous sulphate crystals are heated in a dry boiling tube. (Al 2019, Board Term 1, 2017, 2016)
(a) List any two observations.
(b) Name the type of chemical reaction taking place.
(c) Write balanced chemical equation for the reaction and name the products formed.

Question 19. You might have noted that when copper powder is heated in a China dish, the reddish brown surface of copper powder becomes coated with a black substance. (AI 2019)
(a) Why has this black substance formed?
(b) What is the black substance?
(c) Write the chemical equation of the reaction that takes place.
(d) How can the black coating on the surface be turned reddish brown?

Question 20. Decomposition reactions require energy either in the form of heat or light or electricity for breaking down the reactants. Write one equation each for decomposition reactions where energy is supplied in the form of heat, light and electricity. (2018)

Question 21. Take 3 g of barium hydroxide in a test tube, now add about 2 g of ammonium chloride and mix the contents with the help of a glass rod. Now touch the test tube from outside.
(i) What do you feel on touching the test tube?
(ii) State the inference about the type of reaction occurred.
(iii) Write the balanced chemical equation of the reaction involved. (Board Term I, 2017)

Question 22. (a) A solution of potassium chloride when mixed with silver nitrate solution, an insoluble white substance is formed. Write the chemical reaction involved and also mention the type of the chemical reaction.
(b) Ferrous sulphate when heated, decomposes with the evolution of a gas having a characteristic odour of burning sulphur. Write the chemical reaction involved and identify the type of reaction. (Board Term I, 2016)

Question 23. Name the type of chemical reaction represented by the following equation: (Board Term I, 2016)
(i) $CaO + H_2O \rightarrow Ca(OH)_2$
(ii) $3BaCl_2 + Al_2(SO_4)_3 \rightarrow 2AlCl_3 + 3BaSO_4$
(iii) $2FeSO_4 \xrightarrow{Heat} Fe_2O_3 + SO_2 + SO_3$

Question 24. What is a reduction reaction?
Identify the substances that are oxidised and the substances that are reduced in the following reactions. (Board Term I, 2015)

(a) $Fe_2O_3 + 2Al \rightarrow Al_2O_3 + 2Fe$
(b) $2PbO + C \rightarrow 2Pb + CO_2$

Question 25. (a) Can a displacement reaction be a redox reaction? Explain with the help of an example.
(b) Write the type of chemical reaction in the following:
(i) Reaction between an acid and a base
(ii) Rusting of iron. (Board Term I, 2017)

Question 26. Mention the type of chemical reaction that takes place when: (Board Term I, 2013)
(i) a magnesium ribbon is burnt in air.
(ii) limestone is heated.
(iii) silver bromide is exposed to sunlight.
(iv) electricity is passed through acidified water.
(v) ammonia and hydrogen chloride are mixed with each other.
Write the chemical equation for each reaction.

Question 27. What happens when food materials containing fats and oils are left for a long time? List two observable changes and suggest three ways by which this phenomenon can be prevented. (2020)

Question 28. (i) Why is respiration considered as an exothermic reaction?
(ii) Write chemical name and the formula of the brown gas produced during thermal decomposition of lead nitrate.
(iii) Why do chips manufactures flush bags of chips with gas such as nitrogen? (Board Term I, 2015)

Question 29."We need to balance a skeltal chemical equation." Give reason to justify the statement.

Question 30. Name the reducing agent in the following reaction:
$3MnO_2 + 4Al \longrightarrow 3Mn + 2Al_2O_3$
State which is more reactive, Mn or A1 and why?

Question 31.A Name the type of chemical reaction represented by the following equation:

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

(ii) $3BaCl_2 + Al_2(SO_4)_3 \longrightarrow 3BaSO_4 + 2AlCl_3$

(iii) $2FeSO_4 \xrightarrow{\text{heat}} Fe_2O_3 + SO_2 + SO_3$

Question 32. Write the chemical equation of the reaction in which the following changes have taken place with an example of each:
(i) Change in colour
(ii) Change in temperature
(iii) Formation of precipitate

Question 33.State the type of chemical reactions and chemical equations that take place in the following:
(i) Magnesium wire is burnt in air.
(ii) Electric current is passed through water.
(iii) Ammonia and hydrogen chloride gases'are mixed.

Question 34. 2g of ferrous sulphate crystals are heated in a dry boiling tube.
(i) List any two observations.
(ii) Name the type of chemical reaction taking place.
(iii) 'Write the chemical equation for the reaction.

Question 35. (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.

Question 36.(a) Explain two ways by which food industries prevent rancidity.
(b) Discuss the importance of decomposition reaction in metal industry with three points.

Question 37. What is observed when a solution of potassium iodide solution is added to a solution of lead nitrate? Name the type of reaction. Write a balanced chemical equation to represent the above chemical reaction.

Question 38.Write chemical equation reactions taking place when carried out with the help of
(a) Iron reacts with steam
(b) Magnesium reacts with dil HCl
(c) Copper is heated in air.

Question 39.(a) Write one example for each of decomposion reaction carried out with help of
(i) Electricity (ii) Heat (iii) Light
(b) Which of the following statements is correct and why copper can displace silver from silver nitrate and silver can displace copper from copper sulphate solution.

Question 40. What is meant by skeltal type chemical equation? What does it represent? Using the equation for electrolytic decomposition of water, differentiate between a skeltal chemical equation and a balanced chemical equation.

Question 41.Identify the type of reaction(s) in the following equations.
(i)$CH_4 + 2O_2\ CO_2 + 2\ H_2O$
(ii) $Pb(NO_3)2 + 2KI$ ———>$Pbl_2 + 2KNOs$
(iii) $CaO + H_2O$ ———> $Ca(OH)_2$
(iv) $CuSO_4 + Zn$ ———> $ZnSO_4 + Cu$

Question 42.What is the colour of ferrous sulphate crystals? How does this colour change after heating?

Question 43. Why does the colour of copper sulphate solution change when an iron nail is dipped in it? Write two observations.

Question 44. Translate the following statement into chemical equation and then balance it Barium chloride reacts with aluminium sulphate to give aluminium chloride and a precipitate of barium sulphate. State the two types in which this reaction can be classified.

Question 45. Why are decomposition reactions called the opposite of combination reactions? Write equations for these reactions.

Question 46. What is rancidity? Mention any two ways by which rancidity can be prevented.

Question 47.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.

Question 48. What is redox reaction? Identify the substance oxidised and the substance reduced in the following reactions.
(i)$2PbO + C \longrightarrow 2Pb + CO_2$
(ii)$MnO_2 + 4HCl \longrightarrow MnCl_2 + 2H_20 + Cl_2$

Question 49.State one basic difference between a physical change and a chemical change.

Question 50. What is meant by a chemical reaction?

Question 51. $AgN0_3(aq) + NaCl(aq) \longrightarrow AgCl(s)_4\downarrow + NaN0_3(aq)$
$FeS + H_2S0_4 \longrightarrow FeS0_4 + H_2S\uparrow$
Consider the above mentioned two chemical equations with two different kinds of arrows (↑and ↓) along with product. What do these two different arrows indicate?

Question 52. Hydrogen being a highly inflammable gas and oxygen being a supporter of combustion, yet water which is a compound made up of hydrogen and oxygen is used to extinguish fire. Why?

Question 53.Using a suitable chemical equation, justify that some chemical reactions are determined by:
(i) change in colour, (ii) change in temperature.

Question 54.(a) A solution of substance 'X' is used for white washing. What is the substance 'X'? State the chemical reaction of 'X' with water.
(b) Why does the colour of copper sulphate solution change when an iron nail is dipped in it?

Question 55.Write the balanced equation for the. following reaction and identify the type of reaction in each case.
(i) Potassium bromide + Barium iodide—-> Potassium iodide + Barium bromide.
(ii) Hydrogen(g) + Chlorine(g)—-> Hydrogen chloride(g)

Question 56. A zinc plate was put into a solution of copper sulphate kept in a glass container. It was found that blue colour of the solution gets fader and fader with the passage of time. After few days, when zinc plate was taken out of the solution, a number of holes were observed on it.
(i) State the reason for changes observed on the zinc plate.
(ii) Write the chemical equation for the reaction involved.

Question 57. A white salt on heating decomposes to give brown fumes and a residue is left behind.
(i) Name the salt.
(ii) Write the equation for the decom-position reaction.

Question 58. When a solution of potassium iodide is added to a solution of lead nitrate in a test tube, a reaction takes place.
(a) What type of reaction is this?

(b) Write a balanced chemical equation to represent the above reaction.

Question 59. Write balanced equations for the following mentioning the type of reaction involved.
(i) Aluminium + Bromine ——> Aluminium bromide
(ii) Calcium carbonate——> Calcium oxide + Carbon dioxide
(iii) Silver chloride——>Silver + Chlorine

Question 60.(a) Why is respiration considered as an exothermic reaction?
(b) Define the terms oxidation and reduction.
(c) Identify the substance that is oxidised and reduced in the following reaction.

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

Question 61.You might have noted that when copper powder is heated in a china dish, the surface of copper powder becomes coated with a black colour substance.
(i) How has this black coloured substance formed?
(ii) What is that black substance?
(iii) Write the chemical equation of the reaction that takes place.

Question 62. What happens chemically when quicklime is added to water filled in a bucket?

Question 63. On what basis is a chemical equation balanced?

Question 64. What change in colour is observed when white silver chloride is left exposed to sunlight? State the type of chemical reaction in this change.

Question 65. Write a balanced chemical equation for the reaction between sodium chloride and silver nitrate indicating the physical state of the reactants and the products.

Question 66. What happens when an aqueous solution of sodium sulphate reacts with an aqueous solution of barium chloride? State the physical conditions of reactants in which the reaction between them will not take place. Write the balanced chemical equation for the reaction and name the type of reaction.

Question 67. What is a redox reaction? When a magnesium ribbon burns in air with a dazzling flame and forms a white ash, is magnesium oxidised or reduced? Why?

Question 68. Write any two observations in an activity which may suggest that a chemical reaction has taken place. Give an example in support of your answer.

Question 69.In electrolysis of water, why is the volume of gas collected over one electrode double that of gas collected over the other electrode?

Question 70. Name the products formed on strongly heating ferrous sulphate crystals. What type of chemical reaction occurs in this change?

Question 71. What is an oxidation reaction? Give an example of oxidation reaction. Is oxidation an exothermic or an endothermic reaction?

Question 72. Describe an activity to demonstrate the change that takes place when white silver chloride is kept in sunlight. State the type of chemical reaction which takes place.

Question 73.When magnesium ribbon burns in air or oxygen, a product is formed. State the type of chemical reaction and name the product formed in the reaction. Write balanced chemical equation of this reaction.
Answer.

$$2Mg(s) + O_2(g) \xrightarrow{\text{burning}} 2MgO(s)$$

The type of reaction is combination reaction and the product formed is magnesium oxide.

Question 74.Distinguish between a displacement reaction and a double displacement reaction. Identify the displacement and the double displacement reaction from the following reactions.

Question 75.When you have mixed the solutions of lead(II) nitrate and potassium iodide,
(i) what was the colour of the precipitate formed and can you name the precipitate?
(ii) write the balanced chemical equation for this reaction.
(iii) is this also a double displacement reaction?

Question 76.What do you mean by exothermic and endothermic reactions? Give examples.