Maxprap. Chapter wise Series Class 10th – Chemistry

Class : 10th **Topic : Chemical Reaction and Equations**

Max. Marks : 50 **Duration : 2 Hrs**

Sections: A (MCQs), B (Short Answer-I), C (Short Answer-II), D (Long Answer), E (Case-Based).

General Instructions:

(i). All questions are compulsory.

(ii). This question paper contains 23 questions divided into five Sections A, B, C, D and E. (iii). Section A comprises of 10 MCQs of 1 mark each. Section B comprises of 5 questions of 2 marks each. Section C comprises of 4 questions of 3 marks each. Section D comprises of 2 question of 5 marks each and Section E comprises of 2 Case Study Based Questions of 4 marks each.

(iv). There is no overall choice.

Section A

Questions 1 to 10 carry 1 mark each

1. Which of the following is **not** a thermal decomposition reaction?

a) $Pb(NO_3)_2 \rightarrow 2PbO + 4NO_2 + O_2$ b) $CaCO_3 \rightarrow CaO + CO_2$

c) $2AgCl \rightarrow 2Ag + Cl_2$ d) $2FeSO_4 \rightarrow Fe_2O_3 + SO_2 + SO_3$

2. Which of the following does not represent a redox reaction?

a) $H_2S + CI_2 \rightarrow S + 2HCI$ b) $CuO + H_2 \rightarrow Cu + H_2O$

c) $ZnO + C \xrightarrow{Heat} Zn + CO$ d) $2NaOH + H_2SO_4 \rightarrow Na_2SO_4 + 2H_2O$

3. Strong heating of ferrous sulphate leads to the formation of a brown solid and two gases. This reaction can be categorised as:

a) decomposition and redox b) displacement and endothermic

c) displacement and redox d) decomposition and exothermic

4. When zinc metal is dipped in copper sulphate solution

a) The solution remains blue and copper metal gets deposited.
b) The solution becomes colourless and reddish - brown copper metal gets deposited.
c) No reaction takes place.
d) The solution becomes green and copper metal gets deposited.

a) (C) b) (B) c) (D) d) (A)

5. $Zn + 2CH_3COOH \rightarrow (CH_3COO)_2Zn + H_2$ The above reaction is a:

a) Displacement reaction b) Combination reaction

c) Double displacement reaction d) Decomposition reaction

6. On the basis of evolution or absorption of heat, chemical reactions can be divided in how many types ?

a) One b) Three c) Four d) Two

7. To balance the following chemical equation, the values of the coefficients x, y and z must be respectively: $x\mathrm{Zn(NO_3)_2} \xrightarrow{\Delta} y\mathrm{ZnO} + z\mathrm{NO_2} + \mathrm{O_2}$

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

8. Which of the following reactions is an endothermic reaction?

a) Decomposition of vegetable matter into compost

b) Decomposition of calcium carbonate to form quick lime and carbon dioxide.

c) Burning of coal d) Process of respiration

Assertion(A)/Reason(R) Based (9-10): In the following questions, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

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.

9. Assertion (A): Chips manufacturers usually flush bags of chips with gas such as nitrogen to prevent the chips from getting oxidised.

Reason (R): This increase the taste of the chips and helps in their digestion.

10. Assertion (A): $MnO_2 + 4HCl \rightarrow MnCl_2 + 2H_2O + Cl_2$ is a redox reaction.

Reason (R): In this reaction, HCl is oxidised to Cl_2 and MnO_2 is reduced to $MnCl_2$.

SECTION – B

Questions 11 to 15 carry 2 marks each

11. Write chemical equations for the reactions taking place when

a) Magnesium reacts with dilute HNO_3

b) Sodium reacts with Water.

c) Zinc reacts with dilute hydrochloric acid.

12. Give one example of combustion reaction. Is it exothermic or endothermic?

13. Complete and balance the following chemical equations :

a) $NaOH_{(aq)} + Zn_{(s)} \rightarrow$

b) $CaCO_{3(s)} + H_2O_{(l)} + CO_{2(g)} \rightarrow$

c) $HCl_{(aq)} + H_2O_{(l)} \rightarrow$

14. In the reaction $PbS\ (s) + 4H_2O_2\ (aq) \rightarrow PbSO_4\ (s) + 4H_2O\ (l)$, which is oxidizing agent and which is reducing agent?

15. Identify the type of chemical reaction taking place in each of the following.

a) Barium chloride solution is mixed with a copper sulphate solution and a white precipitate is observed.
b) On heating copper powder in the air in a China dish, the surface of copper powder turns black.
c) On heating, green coloured ferrous sulphate crystals, reddish brown solid is left and the smell of a gas having the odour of burning sulphur is experienced.
d) Iron nails when left dipped in blue copper sulphate solution become brownish in colour and the blue colour of copper sulphate fades away.
e) Quicklime reacts vigorously with water releasing a large amount of heat.

SECTION – C

Questions 16 to 19 carry 3 marks each

16. 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.

17. On heating blue coloured powder of copper (II) nitrate in a boiling tube, copper oxide (black), oxygen gas and a brown gas X is formed.
a) Write a balanced chemical equation of the reaction.
b) Identify the brown gas X evolved.
c) Identify the type of reaction.
d) What could be the pH range of the aqueous solution of the gas X?

18. Silver chloride kept in a china dish turns grey in sunlight.
a) Write the colour of silver chloride when it was kept in the china dish.
b) Name the type of chemical reaction taking place and write the chemical equation for the reaction.
c) State one use of the reaction. Name one more chemical which can be used for the same purpose.

19. A student adds water to a substance X taken in beaker. He feels the beaker turning hot and a hissing sound is produced. Why does this happen? Write a chemical equation for the reaction. State the type of this reaction.

SECTION – D

Questions 20 to 21 carry 5 marks each

20. What is a chemical reaction? Describe one activity each to show that a chemical change has occurred in which (i) change of colour, and (ii) change in temperature has taken place.

21. A silvery - white metal X taken in the form of ribbon, when ignited, burns in air with a dazzling white flame to form a white powder Y. When water is added to powder Y, it dissolves partially to form another substance Z.

a) What could metal X be?
b) What is powder Y?
c) With which substance metal X combines to form powder Y?
d) What is substance Z? Name one domestic use of substance Z.
e) Write a balanced chemical equation of the reaction which takes place when metal X burns in air to form powder Y.

SECTION – E (Case Study Based Questions)

Questions 22 & 23 carry 4 marks each

22. Read the following text carefully and answer the questions that follow:

Redox reactions are those reactions in which oxidation and reduction occur simultaneously. A redox reaction is made up of two half reactions. In the first half reaction, oxidation takes place and in second half reaction, reduction occurs. Oxidation is a process in which a substance loses electrons and in reduction, a substance gains electrons. The substance which gains electrons is reduced and acts as an oxidising agent. On the other hand, a substance which loses electrons is oxidised and acts as a reducing agent.

a) Illustrate where oxidation and reduction occurs together with an example? (1)
b) What do you mean by oxidising agent and reducing agent? (1)
c) For the given reaction, identify the oxidation and reduction parts. (2)
$ZnO + CO \rightarrow Zn + CO_2$

OR

In the following reaction, which substance is reduced? (2)
$PbS + 4H_2O_2 \rightarrow PbSO_4 + 4H_2O$

23. Read the following text carefully and answer the questions that follow:

Those reactions in which two compounds react by an exchange of ions to form two new compounds are called double displacement reactions. A double displacement reaction usually occurs in solution and one of the products, being insoluble, precipitate out (separates as a solid). Any reaction in which an insoluble solid (called precipitate) is formed that separates from the solution is called a precipitation reaction. The reaction in which acid or acidic oxide reacts with base or basic oxide to form salt and water is called neutralisation reaction. For example, $2NaOH + H_2SO_4 \rightarrow Na_2SO_4 + H_2O$

a) 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. Mention the type of reaction. (1)
b) Balance the following chemical reaction. (1)
$Pb(NO_3)_{2(aq)} + KI_{(aq)} \rightarrow PbI_{2(s)} + KNO_{3(aq)}$
c) Barium chloride in reaction with ammonium sulphate forms barium sulphate and ammonium chloride. Which type of chemical reaction represents in this reaction? (2)

OR

Identify A in the following reaction. (2)
$AlCl_{3(aq)} + 3NH_4OH_{(aq)} \rightarrow A + 3NH_4Cl_{(aq)}$

Chemical Reaction and Equations Paper Details – Analysis		
Objective Questions		
MCQ	1 marks x 8 question = 8	
Assertion Reason	1 marks x 2 question = 2	
Subjective		
Short type I	2 marks x 5 question = 10	
Short type II	3 marks x 4 question = 12	
Long Type	5 marks x 2 question = 10	
Case Studies Based		
Case 1	4 marks	
Case 2	4 marks	

Total = 50 marks Your Score =