Chemical Reactions and Equations

Section A: Types of Chemical Reactions

1. Which of the following is a combination reaction?

a) $2H_2O \rightarrow 2H_2 + O_2$

b) $C + O_2 \rightarrow CO_2$

c) $Fe + CuSO_4 \rightarrow FeSO_4 + Cu$

d) $AgNO_3 + NaCl \rightarrow AgCl + NaNO_3$

2. The reaction $2PbO + C \rightarrow 2Pb + CO_2$ is an example of:

a) Combination reaction

b) Decomposition reaction

c) Displacement reaction

d) Double displacement reaction

3. Decomposition reactions are called the opposite of combination reactions because:

a) Both release energy

b) One compound breaks down while two or more combine in the other

c) Both require catalysts

d) Both occur only in presence of light

4. The reaction $Fe_2O_3 + 2Al \rightarrow Al_2O_3 + 2Fe$ is an example of:

a) Combination reaction

b) Double displacement reaction

c) Decomposition reaction

d) Displacement reaction

5. Which of the following is a double displacement reaction?

a) $Zn + H_2SO_4 \rightarrow ZnSO_4 + H_2$

b) $Na_2SO_4 + BaCl_2 \rightarrow BaSO_4 + 2NaCl$

c) $2Mg + O_2 \rightarrow 2MgO$

d) $2KClO_3 \rightarrow 2KCl + 3O_2$

6. Which of the following represents a precipitation reaction?

a) $C + O_2 \rightarrow CO_2$

b) $2H_2 + O_2 \rightarrow 2H_2O$

c) $Na_2SO_4(aq) + BaCl_2(aq) \rightarrow BaSO_4(s) + 2NaCl(aq)$

d) $Zn + 2HCl \rightarrow ZnCl_2 + H_2$

7. The reaction $2AgCl(s) \rightarrow 2Ag(s) + Cl_2(g)$ in sunlight is an example of:

a) Displacement reaction

b) Combination reaction

c) Decomposition reaction

d) Redox reaction only

8. When electricity is passed through water, the reaction that takes place is:

a) Displacement reaction

b) Combination reaction

c) Decomposition reaction

d) Double displacement reaction

9. The reaction between hydrogen and chlorine to form hydrogen chloride is an example of:

a) Combination reaction

b) Decomposition reaction

c) Displacement reaction

d) Double displacement reaction

10. $2KBr(aq) + BaI_2(aq) \rightarrow 2KI(aq) + BaBr_2(s)$ is a:

a) Combination reaction

b) Decomposition reaction

c) Displacement reaction

d) Double displacement reaction

Section B: Oxidation and Reduction

11. Oxidation is a process that involves:

a) Addition of hydrogen

b) Removal of oxygen

c) Addition of oxygen

d) Removal of hydrogen

12. Reduction is a process that involves:

a) Addition of oxygen

b) Addition of hydrogen

c) Removal of hydrogen

d) None of these

13. In the reaction $MnO_2 + 4HCl \rightarrow MnCl_2 + 2H_2O + Cl_2$, the substance oxidized is:

a) MnO_2

b) HCl

c) $MnCl_2$

d) Cl_2

14. In the reaction $H_2S + I_2 \rightarrow 2HI + S$, the oxidizing agent is:

a) H_2S

b) I_2

c) HI

d) S

15. Which of the following statements about the reaction $3Fe + 4H_2O \rightarrow Fe_3O_4 + 4H_2$ are correct?

(i) Iron metal is getting oxidized

(ii) Water is getting reduced

(iii) Water is acting as oxidizing agent

a) (i) and (ii) only

b) (i), (ii) and (iii)

c) (ii) and (iii) only

d) (i) only

16. In the reaction $ZnO + C \rightarrow Zn + CO$, which substance is reduced?

a) ZnO

b) C

c) Zn

d) CO

17. A redox reaction is one in which:

a) Only oxidation occurs

b) Only reduction occurs

c) Both oxidation and reduction occur simultaneously

d) Neither oxidation nor reduction occurs

18. Which of the following is a redox reaction?

a) $CaO + H_2O \rightarrow Ca(OH)_2$

b) $CuSO_4 + Zn \rightarrow ZnSO_4 + Cu$

c) $NaCl + AgNO_3 \rightarrow AgCl + NaNO_3$

d) $NaOH + HCl \rightarrow NaCl + H_2O$

19. In the reaction $4NH_3 + 5O_2 \rightarrow 4NO + 6H_2O$, the substance that is oxidized is:

a) O_2

b) NH_3

c) NO

d) H_2O

20. The substance that loses oxygen or gains hydrogen during a reaction is:

a) Oxidized

b) Reduced

c) Neutralized

d) Precipitated

Section C: Exothermic and Endothermic Reactions

21. Respiration is considered an exothermic reaction because:

a) It requires energy

b) It releases energy

c) It absorbs heat from surroundings

d) It occurs only in presence of light

22. Which of the following is an exothermic process?

(i) Reaction of water with quick lime

(ii) Dilution of an acid

(iii) Evaporation of water

(iv) Sublimation of camphor

a) (i) and (ii)

b) (ii) and (iii)

c) (i) and (iv)

d) (iii) and (iv)

23. Which of the following is an endothermic process?

a) Dilution of sulphuric acid

b) Sublimation of dry ice

c) Burning of LPG

d) Respiration

24. When three beakers containing water are mixed with NaOH, anhydrous $CuSO_4$, and NaCl respectively, the temperature increases in beakers containing:

a) NaOH only

b) $CuSO_4$ only

c) NaOH and $CuSO_4$

d) NaCl only

25. The reaction $CaO + H_2O \rightarrow Ca(OH)_2$ is:

a) Endothermic

b) Exothermic

c) Decomposition reaction

d) Displacement reaction

26. Which of the following is an endothermic reaction?

a) Burning of methane

b) Decomposition of calcium carbonate

c) Reaction of sodium with water

d) Formation of water from H_2 and O_2

27. Photosynthesis is an example of:

a) Exothermic reaction

b) Endothermic reaction

c) Displacement reaction

d) Double displacement reaction

28. Which process involves absorption of heat?

a) Condensation of water vapours

b) Respiration

c) Evaporation of water

d) Dilution of acid

29. When glucose is broken down into CO_2 and H_2O in our body, the reaction is:

a) Endothermic

b) Exothermic

c) Combination

d) Double displacement

30. Slaking of lime ($CaO + H_2O \rightarrow Ca(OH)_2$) is accompanied by:

a) Absorption of heat

b) Evolution of heat

c) No heat change

d) Absorption of light

Section D: Corrosion, Rancidity, and Prevention

31. Rust is chemically:

a) Hydrated ferrous oxide

b) Hydrated ferric oxide

c) Ferric oxide only

d) Ferrous oxide only

32. The process in which metals are eaten up gradually by the action of air, moisture, or chemicals is called:

a) Rancidity

b) Corrosion

c) Rusting

d) Oxidation

33. Rancidity is the process of:

a) Corrosion of metals

b) Oxidation of fats and oils in food

c) Reduction of food

d) Fermentation of food

34. Oil and fat-containing food items are flushed with nitrogen to:

a) Make them taste better

b) Prevent oxidation (rancidity)

c) Increase their weight

d) Preserve colour

35. Which gas can be used for storage of fresh oil for a long time?

a) Oxygen

b) Carbon dioxide

c) Helium or Nitrogen

d) Chlorine

36. Antioxidants are added to food to prevent:

a) Corrosion

b) Rancidity

c) Rusting

d) Fermentation

37. Silver articles turn black due to formation of:

a) AgO

b) Ag_2S

c) $AgNO_3$

d) AgCl

38. Which of the following is NOT a method to prevent rancidity?

a) Adding antioxidants

b) Storing in airtight containers

c) Exposing to sunlight

d) Refrigeration

39. The unpleasant smell and taste in fats and oils due to aerial oxidation is called:

a) Corrosion

b) Reduction

c) Rancidity

d) Decomposition

40. Why do we apply paint on iron articles?

a) To make them look beautiful

b) To prevent corrosion/rusting

c) To increase weight

d) To make them more reactive

Section E: Balancing and Chemical Equations

41. A balanced chemical equation satisfies the:

a) Law of definite proportions

b) Law of conservation of mass

c) Law of multiple proportions

d) Avogadro's law

42. Which information is NOT conveyed by a balanced chemical equation?

a) Physical states of reactants and products

b) Symbols and formulae of substances

c) Whether the reaction is actually feasible

d) Number of atoms/molecules involved

43. The ratio in which hydrogen and oxygen are present in water by volume is:

a) 1:2

b) 2:1

c) 1:1

d) 8:1

44. When hydrogen gas is burnt in oxygen, the product formed is:

a) Hydrogen peroxide

b) Water

c) Oxygen hydride

d) No reaction

45. In the reaction $Zn + 2HCl \rightarrow ZnCl_2 + H_2$, the state of hydrogen gas is usually represented as:

a) (l)

b) (s)

c) (aq)

d) (g)

46. Which of the following is the correct balanced equation for the reaction of iron with copper sulphate?

a) $Fe + CuSO_4 \rightarrow FeSO_4 + Cu$

b) $2Fe + CuSO_4 \rightarrow Fe_2SO_4 + Cu$

c) $Fe + 2CuSO_4 \rightarrow Fe(SO_4)_2 + 2Cu$

d) $Fe + CuSO_4 \rightarrow FeSO_4 + CuO$

47. In the refining of silver, the recovery of silver from silver nitrate solution involves:

a) Copper displacing silver

b) Silver displacing copper

c) Decomposition of silver nitrate

d) Combination with oxygen

48. The shiny brown element X that turns black on heating in air is:

a) Iron

b) Silver

c) Copper

d) Aluminium

49. The formula of slaked lime is:

a) $CaCO_3$

b) CaO

c) $Ca(OH)_2$

d) $CaCl_2$

50. When lead nitrate is heated strongly, the colour of the residue left is:

a) White

b) Yellow

c) Brown

d) Black

Answer Key

Q	A	Q	A	Q	A	Q	A	Q	A
1	b	11	c	21	b	31	b	41	b
2	c	12	b	22	a	32	b	42	c
3	b	13	b	23	b	33	b	43	b
4	d	14	b	24	c	34	b	44	b
5	b	15	b	25	b	35	c	45	d
6	c	16	a	26	b	36	b	46	a
7	c	17	c	27	b	37	b	47	a
8	c	18	b	28	c	38	c	48	c

9	a	19	b	29	b	39	c	49	c
10	d	20	b	30	b	40	b	50	c