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SET 2 – Types and Balancing of Redox Reactions

1. Which of the following is a redox reaction?
   a) $NaOH + HCl \rightarrow NaCl + H_2O$
   b) $2Mg + O_2 \rightarrow 2MgO$
   c) $BaCl_2 + H_2SO_4 \rightarrow BaSO_4 + 2HCl$
   d) $AgNO_3 + NaCl \rightarrow AgCl + NaNO_3$

2. In the reaction $Zn + Cu^{2+} \rightarrow Zn^{2+} + Cu$, which element is oxidised?
   a) Zn
   b) Cu
   c) Zn^{2+}
   d) Cu^{2+}

3. In the above reaction, which species is reduced?
   a) Cu^{2+}
   b) Zn^{2+}
   c) Zn
   d) Cu

4. In the reaction $Fe + CuSO_4 \rightarrow FeSO_4 + Cu$, Fe acts as –
   a) Oxidising agent
   b) Reducing agent
   c) Catalyst
   d) Solvent

5. Reaction between Mg and HCl is –
   a) Combination
   b) Decomposition
   c) Displacement
   d) Double displacement

6. In redox reactions, electrons are transferred from –
   a) Oxidising agent to reducing agent
   b) Reducing agent to oxidising agent
   c) Both ways
   d) None

7. Oxidation number of Fe in Fe_2O_3 is –
   a) +1
   b) +2
   c) +3
   d) +4

8. Oxidation number of nitrogen in NO_3^- is –
   a) +2
   b) +3
   c) +4
   d) +5

9. In reaction $H_2 + Cl_2 \rightarrow 2HCl$, what happens to chlorine?
   a) Oxidised

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b) Reduced
c) Both
d) None

10. In $H_2O_2 \rightarrow H_2O + O_2$, the reaction is an example of –
    a) Combination
    b) Displacement
    c) Disproportionation
    d) Neutralisation

11. In a disproportionation reaction –
    a) One element is oxidised and reduced simultaneously
    b) Two elements are oxidised
    c) Two elements are reduced
    d) None

12. Example of disproportionation reaction –
    a) $2H_2O_2 \rightarrow 2H_2O + O_2$
    b) $Zn + CuSO_4 \rightarrow ZnSO_4 + Cu$
    c) $H_2 + Cl_2 \rightarrow 2HCl$
    d) $NaOH + HCl \rightarrow NaCl + H_2O$

13. In $Na_2S_2O_3$, oxidation number of sulphur is –
    a) +2
    b) +2.5
    c) +3
    d) +4

14. In $KMnO_4$, oxidation number of Mn is –
    a) +2
    b) +4
    c) +6
    d) +7

15. In acidic medium, MnO_4^- changes to –
    a) MnO_2
    b) Mn^{2+}
    c) Mn^{3+}
    d) Mn^+

16. Oxidation state of Cr in $K_2Cr_2O_7$ is –
    a) +2
    b) +3
    c) +6
    d) +7

17. Oxidation number of Fe in Fe_3O_4 is –
    a) +2
    b) +2.67
    c) +3
    d) +4

18. A reducing agent –
    a) Gets oxidised

b) Gets reduced
c) Loses hydrogen
d) Both a and c

19. Oxidising agent –
a) Is oxidised
b) Is reduced
c) Loses electrons
d) None

20. Which reaction is not a redox reaction?
a) Decomposition of $KClO_3$
b) Neutralisation reaction
c) Combination of H_2 and Cl_2
d) Reaction between Zn and Cu^{2+}

21. The oxidation number of oxygen in peroxides is –
a) –2
b) –1
c) 0
d) +1

22. Oxidation number of oxygen in superoxides is –
a) –2
b) –1
c) –½
d) 0

23. Oxidation number of hydrogen in metal hydrides is –
a) +1
b) 0
c) –1
d) +2

24. Oxidation number of nitrogen in N_2H_4 is –
a) 0
b) –1
c) –2
d) –3

25. Oxidation number of chlorine in Cl_2O_7 is –
a) +1
b) +3
c) +5
d) +7

26. Which rule is applied to find oxidation number?
a) Charge balance rule
b) Electroneutrality rule
c) Hydrogen rule
d) All of these

27. In redox reactions, the species losing electrons is called –
a) Oxidised

b) Reduced
c) Oxidising agent
d) None

28. In balancing redox reactions, the total electrons lost equals –
a) Total electrons gained
b) Double of electrons gained
c) Half of electrons gained
d) None

29. In basic medium, redox equations are balanced using –
a) H^+ and H_2O
b) OH^- and H_2O
c) H_2O only
d) None

30. In acidic medium, redox equations are balanced using –
a) OH^-
b) H^+
c) H_2O
d) Both b and c

31. In acidic medium, the half-reaction for reduction of MnO_4^- is –
a) $MnO_4^- \rightarrow Mn^{2+}$
b) $MnO_4^- \rightarrow MnO_2$
c) $MnO_4^- \rightarrow Mn^{3+}$
d) None

32. Number of electrons gained in above reduction is –
a) 1
b) 2
c) 3
d) 5

33. In oxidation half-reaction, electrons appear –
a) On right-hand side
b) On left-hand side
c) Both sides
d) None

34. In reduction half-reaction, electrons appear –
a) On right-hand side
b) On left-hand side
c) Both
d) None

35. Oxidation state of Cl changes from 0 to +1 in –
a) $Cl_2 + H_2O \rightarrow HCl + HOCl$
b) $Cl_2 + 2NaOH$ (hot) $\rightarrow NaCl + NaClO_3 + H_2O$
c) $Cl_2 + 2NaOH$ (cold) $\rightarrow NaCl + NaOCl + H_2O$
d) None

36. In redox reaction, total increase in oxidation number = total –
a) Decrease in oxidation number

b) Number of atoms
c) Moles of electrons
d) None

37. The oxidation number of carbon in HCHO is –
a) 0
b) +2
c) +4
d) –2

38. In CH_3OH, oxidation number of carbon is –
a) +2
b) –2
c) +4
d) –4

39. In CO_2, oxidation number of carbon is –
a) +2
b) +4
c) 0
d) –2

40. When $Cl_2 + H_2S \rightarrow 2HCl + S$,
oxidising agent is –
a) Cl_2
b) H_2S
c) S
d) HCl

41. In the same reaction, reducing agent is –
a) Cl_2
b) H_2S
c) HCl
d) S

42. In acidic medium, $Cr_2O_7^{2-} \rightarrow Cr^{3+}$ involves –
a) Gain of 6 electrons
b) Loss of 6 electrons
c) Gain of 3 electrons
d) None

43. Oxidation number of N in NO_3^- is –
a) +3
b) +4
c) +5
d) +6

44. Oxidation number of S in H_2SO_3 is –
a) +2
b) +4
c) +6
d) +8

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45. Oxidation number of S in $H_2S_2O_8$ (peroxodisulphuric acid) is –
    a) +4
    b) +6
    c) +7
    d) +8

46. Example of oxidation reaction –
    a) Addition of oxygen
    b) Removal of hydrogen
    c) Loss of electrons
    d) All of these

47. Example of reduction reaction –
    a) Addition of hydrogen
    b) Gain of electrons
    c) Loss of oxygen
    d) All of these

48. The equivalent weight of oxidising agent is –
    a) Moles of oxidised substance / electrons lost
    b) Molar mass / number of electrons gained
    c) Molar mass × electrons gained
    d) None

49. The sum of oxidation numbers of all atoms in a neutral compound is –
    a) 0
    b) 1
    c) –1
    d) +1

50. The sum of oxidation numbers of all atoms in an ion is –
    a) Equal to the charge on ion
    b) Always zero
    c) Always one
    d) Always negative

✅ Answers – SET 2

1–b 2–a 3–a 4–b 5–c 6–b 7–c 8–d 9–b 10–c
11–a 12–a 13–b 14–d 15–b 16–c 17–b 18–d 19–b 20–b
21–b 22–c 23–c 24–c 25–d 26–d 27–a 28–a 29–b 30–d
31–a 32–d 33–a 34–b 35–a 36–a 37–b 38–b 39–b 40–a
41–b 42–a 43–c 44–b 45–b 46–d 47–d 48–b 49–a 50–a