Ordinary Thinking

Objective Questions

Oxidation, Reduction

- H_2O_2 reduces MnO_4 ion to [KCET (Med.) 2000]
 - (a) Mn+
- (b) Mn2+
- (c) Mn3+
- (d) Mn
- When a sulphur atom becomes a sulphide ion

- (a) There is no change in the composition of atom
- (b) It gains two electrons
- (c) The mass number changes
- (d) None of these
- The ultimate products of oxidation of most of hydrogen and carbon in food stuffs are [DCE 2001]
 - (a) H,O alone
- (b) CO, alone
- (c) $H_{2}O$ and CO_{2}
- (d) None of these
- When P reacts with caustic soda, the products are PH3 and NaH2PO2. This reaction is an

[IIT 1980; Kurukshetra CEE 1993; CPMT 1997]

- (a) Oxidation
- (b) Reduction
- (c) Oxidation and reduction (Redox)
- (d) Neutralization
- Which one of the following does not get oxidised by bromine water [MP PET/PMT 1988]
 - (a) Fe+2 to Fe+3
- (b) Cu+ to Cu+2
- (c) Mn^{+2} to MnO_1
- (d) Sn +2 to Sn +4
- In the reaction $H_2S + NO_2 \rightarrow H_2O + NO + S$. H_2S is 6.
 - (a) Oxidised
- (b) Reduced
- (c) Precipitated
- (d) None of these
- The conversion of PbO_2 to $Pb(NO_3)_2$ is
 - (a) Oxidation
 - (b) Reduction
 - (c) Neither oxidation nor reduction
 - (d) Both oxidation and reduction
- In the course of a chemical reaction an oxidant 8.

[MP PMT 1986]

- (a) Loses electrons
- (b) Gains electrons
- (c) Both loses and gains electron
- (d) Electron change takes place
- $2Cul \rightarrow Cu + Cul$, the reaction is [RPMT 1997] 9.

- (a) Redox
- (b) Neutralisation

- (c) Oxidation
- (d) Reduction
- H2S reacts with halogens, the halogens[JIPMER 2000] 10.
 - (a) Form sulphur halides(b) Are oxidised
 - (c) Are reduced
- (d) None of these
- 11. H2O2 reduces K4Fe(CN)6
- [MP PMT 1985]
- (a) In neutral solution (b) In acidic solution
- (c) In non-polar solvent (d) In alkaline solution
- Max. number of moles of electrons taken up by 12. one mole of NO3 when it is reduced to[DPMT 2002]
 - (a) NH,
- (b) NH, OH
- (c) NO
- (d) NO,
- In the reaction $3Mg + N_1 \rightarrow Mg_3N_1$ [MP PMT 1999] 13.
 - (a) Magnesium is reduced (b) Magnesium is oxidized
 - (c) Nitrogen is oxidized (d) None of these
- When sodium metal is dissolved in liquid ammonia, blue colour solution is formed. The blue colour is due to

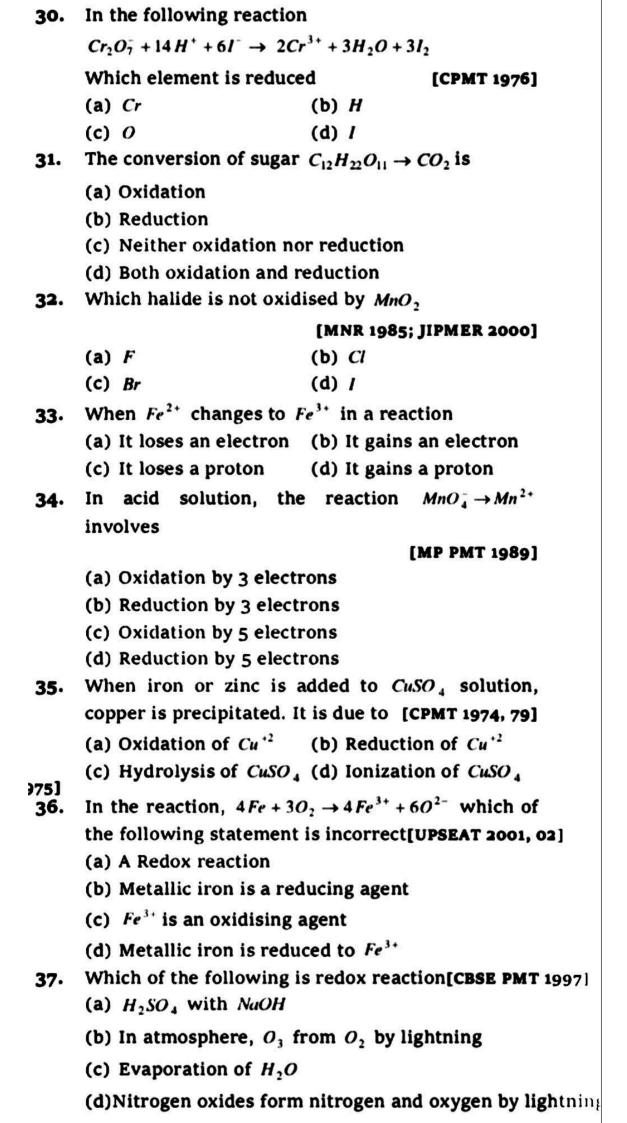
[NCERT 1981]

- (a) Solvated Na ions
- (b) Solvated electrons
- (c) Solvated NH; ions (d) Solvated protons
- Following reaction describes the rusting of iron 15. $4Fe + 30 \rightarrow 4Fe^{3+} + 60^{2-}$

Which one of the following statement is incorrect [NCERT 1981; MNR 1991; AIIMS 1998]

- (a) This is an example of a redox reaction
- (b) Metallic iron is reduced to Fe3+
- (c) Fe^{3+} is an oxidising agent
- (d) Metallic iron is a reducing agent
- 16. SnCl, gives a precipitate with a solution of HgCl, In this process HgCl, is [CPMT 1983]
 - (a) Reduced
 - (b) Oxidised
 - (c) Converted into a complex compound containing both Sn and Hg
 - (d) Converted into a chloro complex of Hg
- Oxidation involves [NCERT 1971, 81; CPMT 1980, 82, 83; MP PMT 1983]
 - (a) Loss of electrons
 - (b) Gain of electrons
 - (c) Increase in the valency of negative part
 - (d) Decrease in the valency of positive part
- 18. Incorrect statement regarding rusting is [MP PET 2000]
 - (a) Metallic iron is oxidised to Fe^{3+} ions
 - (b) Metallic iron is reduced to Fe2- ions
 - (c) Oxygen gas is reduced to oxide ion
 - (d) Yellowish brown product is formed
- When copper turnings are added to silver nitrate 19. solution, a blue coloured solution is formed after some time. It is because, copper[CPMT 1974, 79; DPMT 2000 (a) Displaces silver from the solution

	(b) Forms a blue coloured complex with $AgNO_3$	
	(c) Is oxidised to Cu^{2}	
20.	(d) Is reduced to Cu^{2} . Solution of sodium metal in liquid ammonia is strongly reducing due to the presence of the following in the solution	
	[NCERT 1977; KCET (Med.) 2000]	
	8 . 8	(b) Solvated electrons
	(c) Sodium hydride	
21.	When Sn^{2+} changes to Sn^{4+} in a reaction[CPMT 1981] (a) It loses two electrons(b) It gains two	
electrons		
	(c) It loses two proton	s (d) It gains two protons
22.	Oxidation of thiosulphate $(S_2O_3^2)$ ion by iodine	
	gives	
		[NCERT 1976]
	(a) SO_3^{2-}	(b) SO_4^{2-}
	(c) $S_4O_6^{2-}$	(d) $S_2O_6^{2-}$
23.	$Zn^{2+}(aq) + 2e \rightarrow Zn(s)$. Th	is is [CPMT 1985]
	(a) Oxidation	(b) Reduction
	(c) Redox reaction	
24.	One gas bleaches the colour of flowers by reduction while the other by oxidation[EAMCET 1980]	
	(a) CO and Cl,	1.00 Kindle S.00 K
	(c) H_1S and Br_2	AND USS
		tui wa, and se.
25.		(d) NH_3 and SO_2
25.	Reduction involves	NCERT 1972]
25.		129 189 1 4
25.	Reduction involves (a) Loss of electrons	NCERT 1972]
	Reduction involves (a) Loss of electrons (b) Gain of electrons (c) Increase in the val (d) Decrease in the va	NCERT 1972] ency of positive part lency of negative part
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Answers and Solutions

Oxidation, Reduction

1. (b)
$$2MnO_4^{\Theta} + 5H_2O_2 + 6H^+ \rightarrow Mn^{2+} + 5O_2 + 8H_2O$$
.

2. (b)
$$S + 2e^- \rightarrow S^{2-}$$

4. (c)
$$P_4^0 + 3NaOH + 3H_2O \rightarrow 3NaH_2PO_2 + PH_3$$
.

Sodium hypophosph ite

It shows oxidation and reduction (Redox) properties.

- 6. (a) In this reaction H_2S is oxidised because the oxidation state of 'S' change from 2 to 0.
- 7. (b) $PbO_2 \rightarrow Pb(NO_3)_2$. In this reaction reduction occurs.
- 8. (b) Any substance which is capable of oxidising other substances and is capable of accepting/gaining electron during oxidation is called oxidising agent or oxidant.

- 9. (a) $2CuI \rightarrow Cu + CuI_2$. Oxidation and Reduction both occur so the reaction is redox.
- 10. (c) $H_2S + X_2(Cl, Br, I = X) \rightarrow 2HX + S$. Here the halogen are reduced.
- 11. (b) When H_2O_2 reduces with $K_4[Fe(CN)_6]$. It is present in acidic solution.

$$2K_4[Fe(CN)_6 + H_2SO_4 + H_2O_2 \rightarrow$$

 $2K_3[Fe(CN)_6] + K_2SO_4 + 2H_2O_2$

- 13. (b) In the given reaction oxidation state of Mg is changing from 0 to +2 while in nitrogen it is changing from 0 to -3. So oxidation of Mg and reduction of nitrogen takes place.
- 14. (b) When sodium metal is dissolved in liquid ammonia to form coloured solution. Dilute solutions are bright blue in colour due to the presence of solvated electrons.

$$Na + (x + y)NH_3 \rightarrow [Na(NH_3)_x]^+ + [e(NH_3)_y]^-$$
Blue Colour

15. (b) The metallic iron is oxidised to Fe^{+3} .

Oxidatio

(a)
$$SnCl_2 + 2HgCl_2 \rightarrow SnCl_4 + Hg_2Cl_2(s)$$

Reductio

In this reaction HgCl, is reduced in Hg.

- 17. (a) It is the process in which electrons are lost (de-electronation).
- **18.** (b) $4Fe + 3O_2 \rightarrow 4Fe^{3+} + 6O^{2-}$
- 19. (c) Cu is above of Ag in electrochemical series and thus $Cu + 2Ag^+ \rightarrow Cu^{2+} + 2Ag$ reaction occurs.
- 21. (a) $Sn^{2+} \rightarrow Sn^{4+} + 2e^{-}$. In this reaction Sn^{2+} change in Sn^{4+} it is called an oxidation reaction.

22. (c)
$$2S_2O_3^{2-} + I_2 \rightarrow S_4O_6^{2-} + 2I^-$$
.

- 23. (b) $Z_{n_{(aq)}}^{2+} + 2e^{-} \rightarrow Z_{n_{(1)}}^{0}$ reduction.
- **24.** (b) SO₂ bleaches by reduction while chlorine bleaches colour of flowers by oxidation.
- 25. (b) It is the process in which electrons are gained (electronation).

Oxidation
$$\stackrel{\circ}{\underset{0}{|}} \stackrel{\circ}{\underset{1}{|}} \stackrel{\circ}{\underset{2}{|}} \stackrel{\circ}{\underset{1}{|}} \stackrel{\circ}{\underset{2}{|}} 2-1$$
Reductio

In this reaction Zn atom oxidised to Zn^{2+} ion and iodine reduced to I^- .

27. (c)
$$CrO_4^{2-}$$
 $Cr_2O_7^{2-}$ $x + [(-2) \times 4] = -2$ $2x + (-2) \times 7 = -2$ $x = 8 - 2 = +6$ $2x = 14 - 2 = 12$, $x = \frac{12}{2} = +6$

In this reaction oxidation and reduction are not involved because there is no change in oxidation number.

- 28. (d) $3Br_2 + 6CO_3^{2-} + 3H_2O \rightarrow 5Br^{-} + BrO_3^{-} + 6HCO_3$. In this reaction bromine is oxidised as well as reduced.
- 29. (a) P is oxidized as well as reduced (as in option a).

- 30. (a) $Cr_2O_7^{2-} + 14H^+ + 6I^- \rightarrow 2Cr^{3+} + 3H_2O + 3I_2$
- 31. (a) In this reaction oxidation occur.
- 32. (a) Fluorine has highest E'' value and more reactive than MnO_2 .
- 33. (a) $Fe^{2+} \rightarrow Fe^{3+} + e^{-}$ oxidation.
- 34. (d) $MnO_4^- \rightarrow Mn^{2+}$. In this reaction $5e^-$ are needed for the reduction of Mn^{2+} as:

$$MnO_4^- + 5e^- \rightarrow Mn^{2+}$$
.

Oxidation
$$\begin{array}{c|c}
\hline
Oxidation \\
\hline
0 & +2 \\
\hline
N & + CuSO_4 \rightarrow ZnSO_4 + Cu
\end{array}$$
Reduction

In this reaction Cu^{2+} change in Cu^{n} , hence it is called as reduction reaction.

- 36. (d) $4Fe+3O_2 \rightarrow 4Fe+6O^{2-}$, in this reaction metallic iron is oxidised to Fe^{3+} .
- 37. (d) $2N_2 + O_2 \rightarrow 2NO$

Here O.N. of N increases from O in N_2 to +2 in NO, 2- and that of decreased from O in O_2 to -2 in O, therefore, it is a redox reaction.