EXERCISE-I



- 1. H_2O_2 reduces $K_4Fe(CN)_6$
 - (A) In neutral solution
 - (B) In acidic solution
 - (C) In non-polar solvent
 - (D) In alkaline solution
- 2. Max. number of moles of electrons taken up by one mole of NO_3^- when it is reduced to
 - (A) NH_3 (B) NH_2OH (C) NO (D) NO_2
- 3. In the reaction $3Mg + N_2 \rightarrow Mg_3N_2$
 - (A) Magnesium is reduced
 - (B) Magnesium is oxidized
 - (C) Nitrogen is oxidized
 - (D) None of these
- **4.** When sodium metal is dissolved in liquid ammonia, blue colour solution is formed. The blue colour is due to
 - (A) Solvated Na⁺ions
 - (B) Solvated electrons
 - (C) Solvated NH_2^- ions
 - (D) Solvated protons
- 5. Following reaction describes the rusting of iron $4Fe + 3O_2 \rightarrow 4Fe^{3+} + 6O^{2-}$

Which one of the following statement is incorrect

- (A) This is an example of a redox reaction
- (B) Metallic iron is reduced to Fe^{3+}
- (C) Fe^{3+} is an oxidising agent
- (D) Metallic iron is a reducing agent
- 6. $SnCl_2$ gives a precipitate with a solution of $HgCl_2$. In this process $HgCl_2$ is
 - (A) Reduced
 - (B) Oxidised
 - (C) Converted into a complex compound containing both *Sn* and *Hg*
 - (D) Converted into a chloro complex of Hg

- 7. Oxidation involves (A) Loss of electrons
 - (B) Gain of electrons
 - (C) Increase in the valency of negative part
 - (D) Decrease in the valency of positive part
- **8.** Incorrect statement regarding rusting is
 - (A) Metallic iron is oxidised to Fe^{3+} ions
 - (B) Metallic iron is reduced to Fe^{2-} ions
 - (C) Oxygen gas is reduced to oxide ion
 - (D) Yellowish brown product is formed
- 9. When copper turnings are added to silver nitrate solution, a blue coloured solution is formed after some time. It is because, copper (A) Displaces silver from the solution
 - (B) Forms a blue coloured complex with $AgNO_3$
 - (C) Is oxidised to Cu^{2+}
 - (D) Is reduced to Cu^{2+}
- **10.** Solution of sodium metal in liquid ammonia is strongly reducing due to the presence of the following in the solution
 - (A) Sodium atoms (B) Solvated electrons
 - (C) Sodium hydride (D) Sodium amide
- 11. In a reaction between zinc and iodine, in which zinc iodide is formed, what is being oxidised
 - (A) Zinc ions(B) Iodide ions(C) Zinc atom(D) Iodine
- **12.** Which one of the following reactions does not involve either oxidation or reduction

(A)
$$VO_2^+ \rightarrow V_2O_3$$
 (B) $Na \rightarrow Na^+$
(C) $CrO_4^{2-} \rightarrow Cr_2O_7^{2-}$ (D) $Zn^{2+} \rightarrow Zn$

 $3Br_2 + 6CO_3^{2-} + 3H_2O = 5Br^{-} + BrO_3^{-} + 6HCO_3$

- (A) Bromine is oxidised and carbonate is reduced
- (B) Bromine is reduced and water is oxidised
- (C) Bromine is neither reduced nor oxidised
- (D) Bromine is both reduced and oxidised

Redox Reactions ng agent

14.	In the following reaction,	Oxidizing and Reducing agent			ıt	
	$4P + 3KOH + 3H_2O \rightarrow 3KH_2PO_2 + PH_3$					
	(A) P is oxidized as well as reduced	21.	Which of the	followi	ng cannot	work as
	(B) P is reduced only		oxidising agent		$(\mathbf{D}) V M = C$	`
	(C) <i>P</i> is oxidised only		(A) O_2		(B) KMnC	4
	(D) None of these		(C) I_2		(D) None of	of these
15.	In the following reaction	22.	H_2O_2 is used as			
	$Cr_2O_7^- + 14H^+ + 6I^- \rightarrow 2Cr^{3+} + 3H_2O + 3I_2$		(A) An oxidant o	only		
	Which element is reduced		(B) A reductant	only		
	(A) <i>Cr</i> (B) <i>H</i>		(C) An acid only (D) An oxidant	a reducta	int and an a	cid
	(C) <i>O</i> (D) <i>I</i>	23.	In $C + H_{*}O \rightarrow O$	CO + H.	$H_{\bullet}O$ acts	
16.	The conversion of sugar $C_{12}H_{22}O_{11} \rightarrow CO_2$ is	201	(A) Oxidising as	ent	(\mathbf{R}) Reduct	ing agent
	(A) Oxidation		(C) (A) and (B)	both	(D) None of	of these
	(B) Reduction	24.	Strongest reducin	ng agent	is	
	(C) Neither oxidation nor reduction		(A) <i>F</i> ⁻		(B) <i>Cl</i> ⁻	
	(D) Both oxidation and reduction		(C) <i>Br</i> ⁻		(D) <i>I</i> ⁻	
17.	Which halide is not oxidised by MnO_2	25.	A solution of su	ılphur di	oxide in w	ater reacts
	(A) <i>F</i> (B) <i>Cl</i>		with H_2S preci	pitating	sulphur. He	ere sulphur
	(C) <i>Br</i> (D) <i>I</i>		dioxide acts as			
18.	When Fe^{2+} changes to Fe^{3+} in a reaction		(A) As oxidising	agent	(B) A redu (D) A	cing agent
	(A) It loses an electron	26	(C) An acid	na agant	(D) A cata	lyst
	(B) It gains an electron	20.	(A) K	ing agoint	(B) Mg	
	(C) It loses a proton		$(\mathbf{C}) \mathcal{A}l$		(D) Br	
	(D) It gains a proton	27.	Which substance	e is se	rving as a	reducing
19.	In acid solution, the reaction $MnO_4^- \rightarrow Mn^{2+}$		agent in the follo	wing rea	iction	C
	involves		$14H^+ + Cr_2O_7^{2-} +$	$-3Ni \rightarrow 2$	$2Cr^{3+} + 7H$	$_{2}O + 3Ni^{2+}$
	(A) Oxidation by 3 electrons		(A) H_2O		(B) <i>Ni</i>	
	(B) Reduction by 3 electrons		(C) H^+		(D) $Cr_{2}O_{2}^{2}$	-
	(C) Oxidation by 5 electrons	28.	Which of the	follow	ing acid	nossesses
	(D) Reduction by 5 electrons	201	oxidising, redu	cing an	d complex	x forming
20.	When iron or zinc is added to $CuSO_4$ solution,		properties	•	-	-
	copper is precipitated. It is due to		(A) HNO_3		(B) H_2SO_2	1
	(A) Oxidation of Cu^{+2}		(C) HCl		(D) HNO_2	
	(B) Reduction of Cu^{+2}	29.	Which one is ox	idising su	ubstance	
	(C) Hydrolysis of <i>CuSO</i> ₄		(A) $C_2 H_2 O_2$		(B) <i>CO</i>	
	(D) Ionization of $CuSO_4$		(C) <i>H</i> ₂ <i>S</i>		(D) <i>CO</i> ₂	

30.	The compound that	can work both as	39.	In which compound,	oxidation state of
	$(\Lambda) KM_{2}O$	$(\mathbf{P}) \ \mathbf{H} \ \mathbf{O}$			(\mathbf{D}) \mathcal{M} \mathcal{O}
	(A) $KMnO_4$	(b) $\Pi_2 O_2$		(A) NO	(B) $N_2 O$
	(C) BaO_2	(D) $K_2 Cr_2 O_7$		(C) NH_2OH	(D) $N_2 H_4$
31.	Which one is oxidising	g agent in the reaction	40.	Oxidation number of nic	ckel in $Ni(CO)_4$
	below $2CrO_4^{2-} + 2H^+ -$	$\rightarrow Cr_2O_7^{2-} + H_2O$		(A) 0	(B) + 4
	(A) H^+	(B) $Cr_2O_4^-$		(C) - 4	(D) + 2
	(C) Cr^{++}	(D) None of these	41.	The oxidation number o	f sulphur in H_2SO_4 is
32.	Which is the best descri	iption of the behaviour		(A) - 2	(B) + 2
	of bromine in the reaction	on given below		(C) + 4	(D) + 6
	$H_2O + Br_2 \rightarrow HOBr + H$	HBr	42.	Oxidation state of chlori	ne in perchloric acid is
	(A) Oxidised only			(A) - 1	(B) 0
	(B) Reduced only			(C) – 7	(D) + 7
	(C) Proton acceptor only	y	43.	Oxidation number of N	in <i>HNO</i> ₃ is
	(D) Both oxidised and r	educed		(A) – 3.5	(B) + 3.5
33.	What is the oxidising ag	gent in chlorine water		(C) - 3, +5	(D) + 5
	(A) HCl	(B) $HClO_2$	44.	The oxidation number o	f <i>Mn</i> in MnO_4^{-1} is
	(C) HOCl	(D) None of these		(A) + 7	(B) - 5
34.	In the reaction			(C) + 6	(D) + 5
	$Ag_2O + H_2O_2 \rightarrow 2Ag +$	$H_2O + O_2$, the H_2O_2	45.	Sn^{++} loses two electric	rons in a reaction.
	acts as			What will be the oxidat	ion number of tin after
	(A) Reducing agent	(B) Oxidising agent		the reaction	
	(C) Bleaching agent	(D) None of the above		(A) + 2	(B) Zero
35.	In the reaction			(C) + 4	(D) - 2
	$HAsO_2 + Sn^{2+} \to As + S$	$Sn^{4+} + H_2O$ oxidising	46.	The oxidation number o	f S in $H_2 S_2 O_8$ is
	agent is			(A) + 2	(B) + 4
	(A) Sn^{2+}	(B) Sn^{4+}		(C) + 6	(D) + 7
	(C) As	(D) $HAsO_2$	47.	The oxidation state of ni	itrogen in N_3H is
				(A) 1	$(\mathbf{D}) + 2$
	Oxidation number and	d Oxidation state		$(A) + \frac{-}{3}$	(B) + 3
				$(\mathbf{C}) = 1$	$(D) = \frac{1}{2}$
36.	The oxidation number o	f chlorine in HOCl		(C) = 1	$(D) = \frac{1}{3}$
	(A) - 1	(B) 0	48.	Which of the following	statements is correct
	(C) + 1	(D) + 2		(A) Hydrogen has oxid	ation number -1 and
37.	Oxidation number of S	in S^{2-} is		+1	
	(A) - 2	(B) 0 (D) + 2		(B) Hydrogen has sam	e electronegativity as
30	(U) = 0	(D) + 2		halogens	
38.	Oxidation number of N	$\ln (NH_4)_2 SO_4$ 1s		(C) Hydrogen will not b	e liberated at anode
	(A) - 1 / 3	(B) - 1		(D) Hydrogen has same	ionization potential as
	(C) + 1	(D) - 3		alkalı metals	

$(A) +3$ $(B) +2$ of potassium dichromate, then sulphate is formed. Change in chromium is $(C) +1$ $(D) 0$ $(D) 0$ $(A) +4 \text{ to } +2$ $(B) +5 \text{ to } +3$ $(A) SO_2$ $(B) H_2SO_4$ $(C) +6 \text{ to } +3$ $(D) +7 \text{ to } +7 \text{ to } +3$ $(C) Na_2S_2O_3$ $(D) Na_2S_4O_6$ $(D) -7 \text{ to } +6 \text{ to } +3$ $(D) +7 \text{ to } $	chromium valency of +3 +2 the most lucts of the a are d-2 d+1 i is shown
(C) +1(D) 0sulphate is formed. Change in chromium is50. Sulphur has highest oxidation state in (A) SO_2 (B) H_2SO_4 (A) $+4$ to $+2$ (B) $+5$ to (C) $+6$ to $+3$ (C) $Na_2S_2O_3$ (D) $Na_2S_4O_6$ 60. The oxidation states of electronegative element in the procession	valency of +3 +2 the most lucts of the are d-2 d+1 <i>i</i> is shown
50. Sulphur has highest oxidation state in (A) SO_2 (C) $Na_2S_2O_3$ (B) H_2SO_4 (D) $Na_2S_4O_6$ (C) romium is (A) +4 to +2 (C) +6 to +3 (C) +6 to +3 (C) +7 to (C) The oxidation states of electronegative element in the procession of the states of electronegative element in the procession.	+3 +2 the most lucts of the are d-2 d+1 <i>i</i> is shown
(A) SO_2 (B) H_2SO_4 (C) $Na_2S_2O_3$ (D) $Na_2S_4O_6$ (B) H_2SO_4 (C) $+6$ to $+3$ (D) $+7$ to (D) $+7$ to electronegative element in the processing of the second states of the secon	+2 the most lucts of the are d-2 d+1 <i>i</i> is shown
(C) $Na_2S_2O_3$ (D) $Na_2S_4O_6$ 60. The oxidation states of electronegative element in the proceeding of the states of the st	the most lucts of the d - 2 d + 1 i is shown
electronegative element in the proc	lucts of the a are d - 2 d + 1 i is shown
51. The oxidation number of Fe and S in iron	d_{+} are d - 2 d + 1 i is shown
pyrites are reaction of BaO_2 with dilute H_2SO_2	d - 2 d + 1 <i>i</i> is shown
(A) $4, -2$ (B) $2, -1$ (A) 0 and -1 (B) -1 and (C) -2 and 0 (D) -2 and (D) -2 an	a + 1 <i>i</i> is shown
(C) $3, -1.5$ (D) $3, -1$ (C) -2 and 0 (D) -2	<i>i</i> 15 5110 wit
52. The oxidation number of nitrogen in NO_3^- is by	
(A) -1 (B) $+2$ (A) $K_2 MnO_4$ (B) $KMnO_4$	\mathcal{O}_4
(C) + 3 (D) + 5 (C) MnO_2 (D) Mn_2C) ₂
53. Oxidation state of elemental carbon is 62. The oxidation number of carbon in	$CH_{2}O$ is
(A) 0 (B) 1 (A) -2 (B) $+2$	-
(C) 2 (D) 3 (C) 0 (D) $+ 4$	
54. The sum of the oxidation numbers of all the 63. Oxidation state of oxygen in	hydrogen
carbons in C_6H_5CHO is peroxide is	
(A) + 2 (B) 0 (A) - 1 (B) + 1 (C) 0 (D) - 2	
(C) + 4 (D) - 4 (C) C (C) C (D) -2 64. The oxidation number of Cr in K_2	$Cr_{2}O_{7}$ is
55. Which one of the following has the highest $(A) + 6$ $(B) - 7$	- 2 - 1 -
oxidation number of iodine $(C) + 2$ $(D) - 2$	
(A) KI_3 (B) KI 65. In which of the following	compounds
(C) IF_5 (D) KIO_4 transition metal is in oxidation state	zero
56. In which of the following compounds iron has (A) $[Co(NH_3)_6]Cl_2$ (B) $[Fe(H_3)_6]Cl_2$	$[_{2}O)_{6}SO_{4}$]
lowest oxidation state (C) $[Ni(CO)_4]$ (D) $[Fe(H)]$	$_{2}O)_{3} J(OH)_{2}$
(A) $FeSO_4.(NH_4)_2SO_4.6H_2O$ 66. Sulphur has lowest oxidation numb	er in
(B) $K_4 Fe(CN)_6$ (A) $H_2 SO_3$ (B) SO_2	<i>т</i> .
(C) $Fe(CO)_5$ (D) Ca , H_2SO_4 (D) Ca (D) Ca , H_2SO_4 (D) Ca (D	K, Li
(D) Fe_2O 67. The oxidation number and consultation for the subput molecular subput in the subput molecular for the subput molecular subput for the subpu	alency of (S) are
57. The oxidation number of hydrogen in MH_2 is respectively	(28) 410
(A) + 1 (B) - 1 (A) 0 and 2 (B) 6 and	8
(C) + 2 (D) - 2 (C) 0 and 8 (D) 6 and	2
58. Oxidation number of iodine varies from 68. In ferrous ammonium sulphate	oxidation
(A) -1 to $+1$ (B) -1 to $+7$ number of <i>Fe</i> is (A) $+3$ (B) $+2$	
(C) +3 to +5 (D) -1 to +5 (C) +1 (D) -2	

- **69.** The oxidation number of nitrogen in NH_2OH is
 - (A) + 1 (B) 1
 - (C) 3 (D) 2
- 70. The oxidation number of phosphorus in $Ba(H_2PO_2)_2$ is
 - (A) 1 (B) + 1
 - (C) + 2
- **71.** A compound is in its low oxidation state. Then its will be

(D) + 3

- (A) Highly acidic
- (B) Highly basic
- (C) Highest oxidising property
- (D) Half acidic, half basic
- **72.** The oxidation number and the electronic configuration of sulphur in H_2SO_4 is

(A) + 4;
$$1s^2 2s^2 2p^6 3s^2$$

(B) + 2; $1s^2 2s^2 2p^6 3s^2 3p^2$
(C) + 3; $1s^2 2s^2 2p^6 3s^2 3p^1$
(D) + 6; $1s^2 2s^2 2p^6$

73. The oxidation number of Mn in NO_2 is

(A) + 7		(B) - 7
(C) + 1		(D) – 1

74. Oxidation number of As atoms in H_3AsO_4 is

(A) - 3	(B) + 4
(C) + 6	(D) + 5

75. In XeO_3 and XeF_6 the oxidation state of Xe is

(A) + 4	(B) + 6
(C) + 1	(D) + 3

76. Oxidation state of oxygen atom in potassium superoxide is

(A) 0	(B) – 1
(C) $-\frac{1}{2}$	(D) – 2

77. Oxidation number of S in S_2Cl_2 is

(A) + 1	(B) – 1
(C) + 6	(D) 0

78.	What	is	the	oxidation	number	of	sulphur	in
	Na_2S_2	$_{4}O_{6}$	5					

(A)
$$\frac{2}{3}$$
 (B) $\frac{3}{2}$
(C) $\frac{3}{5}$ (D) $\frac{5}{2}$

- **79.** When $CuSO_4$ reacts with KI, the oxidation number of Cu changes by
 - (A) 0 (B) -1(C) 1 (D) 2
- **80.** The oxidation number of N in NH_4Cl is

(A) + 5	(B) + 3
(C) - 5	(D) - 3

- **81.** In which reaction there is a change in valency (A) $2NO_2 \rightarrow N_2O_4$
 - (B) $2NO_2 + H_2O \rightarrow HNO_2 + HNO_3$
 - (C) $NH_4OH \rightarrow NH_4^+ + OH^-$
 - (D) $CaCO_3 \rightarrow CaO + CO_2$
- **82.** Oxidation state of Fe in Fe_3O_4 is

(A) $\frac{3}{2}$	(B) $\frac{4}{5}$
(C) $\frac{5}{4}$	(D) $\frac{8}{3}$

83. Nitrogen show different oxidation states in the range

(A) 0 to +5	(B) - 3 to + 5
(C) - 5 to + 3	(D) - 3 to + 3

- **84.** Oxidation number of Mn in K_2MnO_4 and $MnSO_4$ are respectively
 - (A) + 7, + 2(B) + 6, + 2(C) + 5, + 2(D) + 2, + 6
- **85.** Identify the element which can have highest oxidation numbers

(A)	Ν	(B)	0
~ /			

(C) Cl (D) C

Redox reaction and Method for balancing Redox reaction

86. How many moles of $K_2 Cr_2 O_7$ can be reduced by 1 mole of Sn^{2+}

(A) 1/3 (B) 1/6

- (C) 2/3 (D) 1
- 87. $2MnO_4^- + 5H_2O_2 + 6H^+ \rightarrow 2 Z + 5O_2 + 8H_2O$. In this reaction Z is
 - (A) Mn^{+2} (B) Mn^{+4}
 - (C) MnO_2 (D) Mn
- 88. What is 'A' in the following reaction $2Fe^{3+}_{(aq)} + Sn^{2+}_{(aq)} \rightarrow 2Fe^{2+}_{(aq)} + A$ (A) $Sn^{3+}_{(aq)}$ (B) $Sn^{4+}_{(aq)}$
 - (C) $Sn^{2+}_{(aq)}$ (D) Sn
- **89.** For the redox reaction

 $MnO_4^- + C_2O_4^{-2} + H^+ \rightarrow Mn^{2+} + CO_2 + H_2O$ the correct coefficients of the reactants for the balanced reaction are $MnO_4^- C_2O_4^{2-} H^+$

- (A) 2 5 16 (B) 16 5 2 (C) 5 16 2 (D) 2 16 5
- **90.** Which of the following is a redox reaction (A) $NaCl + KNO_3 \rightarrow NaNO_3 + KCl$
 - (B) $CaC_2O_4 + 2HCl \rightarrow CaCl_2 + H_2C_2O_4$
 - (C) $Mg(OH)_2 + 2NH_4Cl \rightarrow MgCl_2 + 2NH_4OH$
 - (D) $Zn + 2AgCN \rightarrow 2Ag + Zn(CN)_2$

Auto oxidation and Disproportionation

- 91. The metal used in galvanizing of iron is(A) *Pb*(B) *Zn*
 - (C) Al (D) Sn
- **92.** In which of the following reactions there is no change in valency
 - (A) $4KClO_3 \rightarrow 3KClO_4 + KCl$
 - (B) $SO_2 + 2H_2S \rightarrow 2H_2O + 3S$
 - (C) $BaO_2 + H_2SO_4 \rightarrow BaSO_4 + H_2O_2$
 - (D) $2BaO + O_2 \rightarrow 2BaO_2$
- 93. The equivalent weight of phosphoric acid (H_3PO_4) in the reaction $NaOH + H_3PO_4 \rightarrow NaH_2PO_4 + H_2O$ is (A) 25 (B) 49 (C) 59 (D) 98
- **94.** What is the equivalent mass of IO_4^- when it is converted into I_2 in acid medium
 - (A) *M*/6 (B) *M*/7 (C) *M*/5 (D) *M*/4
- **95.** For decolourization of 1 mole of $KMnO_4$, the moles of H_2O_2 required is
 - (A) 1/2 (B) 3/2 (C) 5/2 (D) 7/2