1. Which reaction does not represent autoredox or disproportionation :-

(1) $Cl_2 + OH^- \longrightarrow Cl^- + ClO_3^- + H_2O$

(2) $2H_2O_2 \longrightarrow H_2O + O_2$

(3) $2Cu^+ \longrightarrow Cu^{+2} + Cu$

(4) $(NH_4)_2Cr_2O_7 \longrightarrow N_2 + Cr_2O_3 + 4H_2O$

2. Which of the following is not a redox reaction?

(1) $BaO_2 + H_2SO_4 \rightarrow BaSO_4 + H_2O_2$

(2) $2BaO + O_2 \rightarrow 2BaO_2$

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

(4) $SO_2 + 2H_2S \rightarrow 2H_2O + 3S$

3. H_2O_2 acts as a reducing agent in :

(1) $FeCl_2 + HCl + H_2O_2 \longrightarrow FeCl_3 + H_2O$

(2) $Cl_2 + H_2O_2 \longrightarrow HCl + O_2$

(3) $HI + H_2O_2 \longrightarrow I_2 + H_2O$

(4) $H_2SO_3 + H_2O_2 \longrightarrow H_2SO_4 + H_2O$

4. Match List-I (Compounds) with List-II (Oxidation states of nitrogen) and select answer using the codes given below the lists :-

	List-I	**List-II**
(a)	NaN_3	1. +5
(b)	N_2H_2	2. +2
(c)	NO	3. –1/3
(d)	N_2O_5	4. –1

Code :	(a)	(b)	(c)	(d)
(1)	3	4	2	1
(2)	4	3	2	1
(3)	3	4	1	2
(4)	4	3	1	2

5. In the reaction

$xHI + yHNO_3 \longrightarrow NO + I_2 + H_2O$

(1) x = 3, y = 2 (2) x = 2, y = 3

(3) x = 6, y = 2 (4) x = 6, y = 1

6. The number of electrons to balance the following equation :-

$NO_3^- + 4H^+ + e^- \rightarrow 2H_2O + NO$ is

(1) 5 (2) 4

(3) 3 (4) 2

7. Number of moles of electrons taken up when 1 mole of NO_3^- ions is reduced to 1 mole of NH_2OH is

(1) 2 (2) 4 (3) 5 (4) 6

8. 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^+
(1)	2	5	16
(2)	16	5	2
(3)	5	16	2
(4)	2	16	5

9. In a redox reaction, the equivalent weight of HNO_2 is found to be 23.5. The reaction products might contain

(1) NO_2 (2) NO

(3) NH_3 (4) HNO_3

10. When $KBrO_3$ ion reacts with Br^- ion in acid solution Br_2 is liberated. The equivalent weight of $KBrO_3$ in this reaction is

(1) M/8 (2) M/3

(3) M/5 (4) M/6

11. In the reaction $CrO_5 + H_2SO_4 \rightarrow Cr_2(SO_4)_3 + H_2O + O_2$ one mole of CrO_5 will liberate how many moles of O_2 :-

(1) 5/2 (2) 5/4

(3) 9/2 (4) 7/2

12. A solution of $KMnO_4$ is reduced to MnO_2. The normality of solution is 0.6. The molarity is:

(1) 1.8M (2) 0.6M

(3) 0.1M (4) 0.2M

13. 0.52 g of a dibasic acid required 100 mL of 0.2 N NaOH for complete neutralization.

The equivalent weight of acid is

(1) 26 (2) 52

(3) 104 (4) 156

14. The number of moles of $KMnO_4$ that will be required to react with 2 mol of ferrous oxalate is

(1) $\frac{6}{5}$ (2) $\frac{2}{5}$ (3) $\frac{4}{5}$ (4) 1

15. The mass of oxalic acid crystals ($H_2C_2O_4 . 2H_2O$) required to prepare 50 mL of a 0.2 N solution is :-

(1) 4.5 g (2) 6.3 g

(3) 0.63 g (4) 0.45 g

16. The minimum quantity of H_2S needed to precipitate 63.5 g of Cu^{2+} will be nearly.

(1) 63.5 g (2) 31.75 g (3) 34 g (4) 2.0 g

17. The volume of 1.5 MH_3PO_4 solution required to neutralize exactly 90 mL of a 0.5 M $Ba(OH)_2$ solution is :-

(1) 10 mL (2) 30 mL (3) 20 mL (4) 60 mL

18. The number of moles of $Cr_2O_7^{2-}$ needed to oxidize 0.136 equivalents of $N_2H_5^+$ by the reaction $N_2H_5^+ + Cr_2O_7^{2-} \rightarrow N_2 + Cr^{3+} + H_2O$ is

(1) 0.136 (2) 0.068 (3) 0.0227 (4) 0.272

19. As_2O_3 is oxidised to H_3AsO_4 by $KMnO_4$ in acidic medium. Volume of 0.02M $KMnO_4$ required for this purpose by 1mmol of As_2O_3 will be

(1) 10 mL (2) 20 mL (3) 40 mL (4) 80 mL

20. 0.3 g of an oxalate salt was dissolved in 100 mL solution. The solution required 90 mL of N/20 $KMnO_4$ for complete oxidation. The % of oxalate ion in salt is :-

(1) 33% (2) 66% (3) 70% (4) 40%

21. Equivalent weight of H_3PO_2 when it disproportionate into PH_3 and H_3PO_3 is :-

(1) M (2) M/2 (3) M/4 (4) 3M/4

22. 4 mole of a mixture of Mohr's salt and $Fe_2(SO_4)_3$ requires 500 mL of 1 M $K_2Cr_2O_7$ for complete oxidation in acidic medium. The mole % of the Mohr's salt in the mixture is :-

(1) 25 (2) 50 (3) 60 (4) 75

23. The oxidation number of sulphur in S_8, S_2F_2, H_2S and H_2SO_4 respectively are :-

(1) 0, + 1, –2 and 6 (2) +2, 0, + 2 and 6

(3) 0, + 1, +2 and 4 (4) –2, 0, + 2 and 6

24. In which of the following the oxidation number of oxygen has been arranged in increasing order :-

(1) $OF_2 < KO_2 < BaO_2 < O_3$

(2) $BaO_2 < KO_2 < O_3 < OF_2$

(3) $BaO_2 < O_3 < OF_2 < KO_2$

(4) $KO_2 < OF_2 < O_3 < BaO_2$

25. Which reaction does not represent auto redox or disproportionation :-

(1) $Cl_2 + OH^- \longrightarrow Cl^- + ClO_3^- + H_2O$

(2) $2HI_2O_2 \longrightarrow H_2O + O_2$

(3) $2Cu^+ \longrightarrow Cu^{2+} + Cu$

(4) $(NH_4)_2Cr_2O_7 \longrightarrow N_2 + Cr_2O_3 + 4H_2O$

26. Equivalent weight of FeS_2 in the half reaction $FeS_2 \longrightarrow Fe_2O_3 + SO_2$ is :-

(1) M/10 (2) M/11 (3) M/6 (4) M/1

27. $KMnO_4$ reacts with oxalic acid according to the equation :-

$$2MnO_4^- + 5C_2O_4^{2-} + 16H^+ \longrightarrow 2Mn^{2+} + 10CO_2 + 8H_2O$$

Here, 20 mL of 0.1 M $KMnO_4$ is equivalent to:-

(1) 120 mL of 0.25 $MH_2C_2O_4$

(2) 150 mL of 0.10 $MH_2C_2O_4$

(3) 25 mL of 0.20 $MH_2C_2O_4$

(4) 50 mL of 0.20 $MH_2C_2O_4$

28. $I_2 + OH^- \longrightarrow I^- + IO_3^- + H_2O$ η-factor of I_2 in the above reaction will be :

(1) 10 (2) $\frac{5}{6}$ (3) $\frac{5}{3}$ (4) 1

29. The oxidation state of chromium in the final product formed by the reaction between KI and acidied potassium dichromate solution is :-

(1) +3 (2) +2 (3) +6 (4) +4

30. Equivalents of MnO_4^- and $Cr_2O_7^{2-}$ per mole of the ion in acidic medium are in the ratio of :-

(1) 1 : 1 (2) 1 : 5 (3) 5 : 6 (4) 6 : 1

ANSWER KEY — Exercise-I

Que.	1	2	3	4	5	6	7	8	9	10
Ans.	**4**	**1**	**2**	**1**	**3**	**3**	**4**	**1**	**4**	**3**
Que.	11	12	13	14	15	16	17	18	19	20
Ans.	**4**	**4**	**1**	**1**	**3**	**3**	**3**	**3**	**3**	**2**
Que.	21	22	23	24	25	26	27	28	29	30
Ans.	**4**	**4**	**1**	**2**	**4**	**2**	**3**	**3**	**1**	**3**