JEE CHEMISTRY

Topic: Redox

Q.1 **Oxidation number of Fe in Fe_3O_4 is fractional because-**

(A) It is a mixed [Fe(+2), Fe(+4)] oxide

(B) It is a non-stoichiometric compound

(C) It is a mixed [Fe(+2), Fe(+3)] oxide

(D) None of the above

Q.2 **The oxidation state of Oxygen atom in potassium superoxide is-**

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

Q.3 **The oxidation state of tungsten in $Na_2W_4O_{13}.10H_2O$ is –**

(A) + 7 **(B) + 6**

(C) + 4 **(D) + 4.5**

Q.4 **Amongst the following identify the species with an atom in +6 oxidation state –**

(A) MnO_4^- **(B)** $Cr(CN)_6^{3-}$

(C) NiF_6^{2-} **(D)** CrO_2Cl_2

Q.5 **In $[Cr(O_2)(NH_3)_4(H_2O)]Cl_2$ oxidation number of Cr is + 3, then O_2 will be in the form :**

(A) dioxide **(B) peroxide**

(C) superoxide **(D) oxide**

Q.6 An example of redox process is –

(A) $CuSO_4 + Fe \rightarrow FeSO_4 + Cu$

(B) $Ca(OH)_2 + 2HCl \rightarrow CaCl_2 + 2H_2O$

(C) $CaO + 2HCl \rightarrow CaCl_2 + H_2O$

(D) $CaCO_3 \quad CaO + CO_2$

Q.7 In the reduction of dichromate by Fe(II), the number of electrons involved per chromium atom is-

(A) 3 (B) 1 (C) 2 (D) 4

Q.8 Consider the following statement in the reaction

$KIO_3 + 5KI + 6HCl = 3I_2 + 6KCl + 3H_2O$

(a) KI is oxidised to I_2

(b) KIO_3 **is oxidised to** I_2

(c) KIO_3 **is reduced to** I_2

(d) Oxidation number of I increases from (–1) in KI to zero in I_2 **of these statements**

(A) a, c and d are correct

(B) a, b and d are correct

(C) b and d are correct

(D) a alone is correct

Q.9 Match list – I (compounds) with list – II

(Oxidation state of nitrogen) and select the correct answer using the codes given below the lists –

List – I	List – II
(A) NaN_3	**(a) +5**
(B) N_2H_4	**(b) +2**
(C) NO	**(c) –1/3**
(D) N_2O_5	**(d) –2**

Codes :–

	A	B	C	D
(A)	c	d	b	a
(B)	d	c	b	a
(C)	c	d	a	b
(D)	d	c	a	b

Q.10 In the reaction,

$3Br_2 + 6NaOH \rightarrow NaBrO_3 + 5NaBr + 3H_2O$ which element loses as well as gains electrons –

(A) Na (B) Br (C) O (D) H

Q.11 Oxidation number of S in $H_2S_2O_7$ is –

(A) +4 (B) –6 (C) –5 (D) +6

Q.12 Oxidation number of S in H_2SO_5 is 6. This is observed, because –

(A) There are five oxygen atoms in the molecule

(B) The hydrogen atom is directly linked with non-metal

(C) There is peroxide linkage in the molecule

(D) The sulphur atom shows co-ordinate linkage

Q.13 The oxidation number of S in $Na_2S_4O_6$ is -

(A) + 2.5

(B) + 2 and + 3 (two S have + 2 and other two have + 3)

(C) + 2 and + 3 (three S have + 2 and one S has + 3)

(D) + 5 and 0 (two S have + 5 and the other two have 0)

Q.14 The oxidation state of molybdenum in its oxocomplex species $[Mo_2O_4(C_2H_4)_2(H_2O)_2]^{2-}$ is –

(A) +2 (B) +3

(C) +4 (D) +5

Q.15 Which element will have the maximum oxidation number in $K_2Cr_2O_7$ and $KMnO_4$ –

(A) Mn (B) Cr

(C) O (D) K

Q.16 Select the pair of oxidation processes,

(a) $2Cu^{2+} \rightarrow Cu_2^{2+}$

(b) $MnO_4^- \rightarrow Mn^{2+}$

(c) $[Fe(CN)_6]^{-4} \rightarrow [Fe(CN)_6]^{-3}$

(d) $2I^- \rightarrow I_2$

(A) a, b (B) c, d (C) a, d (D) b, c

Q.17 Carbon is in the lowest oxidation state in –

(A) CH_4 (B) CCl_4 (C) CF_4 (D) CO_2

Q.18 $AB_4^- + C^{+2} \rightarrow C^{+3} + A^{+2}$

If the O.N. of B is –2. Choose the true statement for the above change –

(A) O.N. of A decreases by –5

(B) O.N. of C decreases by +1

(C) O.N. of A decreases by + 5 and that of C increases by +1

(D) O.N. of A decreases by +5 and that of C decreases by +1

Q.19 Oxygen shows oxidation state of –1 in the compound –

(A) NO_2 (B) MnO_2

(C) PbO_2 (D) Na_2O_2

Q.20 The oxidation number of Pt in $[Pt(C_2H_4)Cl_3]^-$ is

(A) +1 (B) +2 (C) +3 (D) +4

Q.21 Which of the following reactions does not involve either oxidation or reduction –

(A) $VO^{2+} \rightarrow V_2O_3$

(B) $Na \rightarrow Na^+$

(C) $Zn^{+2} \rightarrow Zn$

(D) $CrO_4^{-2} \rightarrow Cr_2O_7^{-2}$

Q.22 Which one is correctly matched:

Substance	O.N. of S
(A) H_2S	+2
(B) H_2SO_5	+4
(C) H_2SO_4	+4
(D) $Na_2S_4O_6$	+2.5

Q.23 In which of the following compounds iron has lowest oxidation state –

(A) $FeSO_4.(NH_4)_2SO_4.6H_2O$

(B) $K_4Fe(CN)_6$

(C) $Fe(CO)_5$

(D) K_2FeO_4

Q.24 Sulphur has lowest oxidation number in –

(A) H_2SO_3 **(B)** SO_2

(C) H_2SO_4 **(D)** H_2S

Q.25 Oxidation numbers of two Cl atoms in bleaching powder, $CaOCl_2$ is –

(A) –1,–1 **(B) +1, –1**

(C) +1,+1 **(D) 0, –1**

Q.26 In which of the following reactions the starred element acts as oxidising agent –

(A) $Fe^* + CuSO_4 \rightarrow Cu + FeSO_4$

(B) $H_2^* + Cl_2 \rightarrow 2HCl$

(C) $C^* + H_2O \rightarrow CO + H_2$

(D) $Mn^*O_2 + 4HCl \rightarrow MnCl_2 + Cl_2 + 2H_2O$

Q.27 Equivalent weight of FeC_2O_4 in the change,

$FeC_2O_4 \rightarrow Fe^{3+} + CO_2$ is

(A) M/3 **(B) M/6**

(C) M/2 **(D) M/1**

Q.28 $H_2MoO_4 \rightarrow MoO_2^+$ **in the process** H_2MoO_4 **–**

(A) Acts as a reducing agent

(B) Acts as an oxidising agent

(C) Acts both as a reducing and oxidising agent

(D) None of these

Q.29 **In the following reaction**

$O_3 + 6I^- + 6H^+ \longrightarrow 3I_2 + 3H_2O$

equivalent weight of O_3 **(with molecular weight M) is -**

(A) $\frac{M}{2}$ **(B)** $\frac{M}{4}$ **(C)** $\frac{M}{24}$ **(D)** $\frac{M}{6}$

Q.30 **2 mole of** N_2H_4 **loses 20 moles of electrons to form a compound Y. Assuming that all nitrogen appears in the new compound, if there is no change in O.N. of hydrogen, the O.N. of nitrogen in Y is**

(A) + 3 (B) – 3 (C) + 1 (D) + 5

ANSWER KEY

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