

**JEE CHEMISTRY**

*Topic: Redox*

- Q.1 Oxidation number of Fe in  $\text{Fe}_3\text{O}_4$  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  $\text{Na}_2\text{W}_4\text{O}_{13} \cdot 10\text{H}_2\text{O}$  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)  $\text{MnO}_4^-$  (B)  $\text{Cr}(\text{CN})_6^{3-}$   
(C)  $\text{NiF}_6^{2-}$  (D)  $\text{CrO}_2\text{Cl}_2$
- Q.5 In  $[\text{Cr}(\text{O}_2)(\text{NH}_3)_4(\text{H}_2\text{O})] \text{Cl}_2$  oxidation number of Cr is +3, then  $\text{O}_2$  will be in the form :
- (A) dioxide (B) peroxide  
(C) superoxide (D) oxide

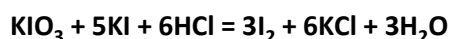
Q.6 An example of redox process is –

- (A)  $\text{CuSO}_4 + \text{Fe} \rightarrow \text{FeSO}_4 + \text{Cu}$
- (B)  $\text{Ca(OH)}_2 + 2\text{HCl} \rightarrow \text{CaCl}_2 + 2\text{H}_2\text{O}$
- (C)  $\text{CaO} + 2\text{HCl} \rightarrow \text{CaCl}_2 + \text{H}_2\text{O}$
- (D)  $\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$

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



- (a) KI is oxidised to  $\text{I}_2$
  - (b)  $\text{KIO}_3$  is oxidised to  $\text{I}_2$
  - (c)  $\text{KIO}_3$  is reduced to  $\text{I}_2$
  - (d) Oxidation number of I increases from (-1) in KI to zero in  $\text{I}_2$  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) $\text{NaN}_3$         | (a) +5     |
| (B) $\text{N}_2\text{H}_4$ | (b) +2     |
| (C) NO                     | (c) $-1/3$ |
| (D) $\text{N}_2\text{O}_5$ | (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,



- (A) Na    (B) Br    (C) O    (D) H

Q.11 Oxidation number of S in  $\text{H}_2\text{S}_2\text{O}_7$  is –

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

Q.12 Oxidation number of S in  $\text{H}_2\text{SO}_5$  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  $\text{Na}_2\text{S}_4\text{O}_6$  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)

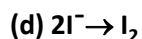
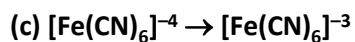
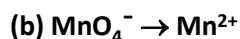
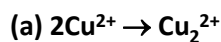
Q.14 The oxidation state of molybdenum in its oxocomplex species  $[\text{Mo}_2\text{O}_4(\text{C}_2\text{H}_4)_2(\text{H}_2\text{O})_2]^{2-}$  is –

- (A) +2                      (B) +3  
(C) +4                      (D) +5

Q.15 Which element will have the maximum oxidation number in  $\text{K}_2\text{Cr}_2\text{O}_7$  and  $\text{KMnO}_4$  –

- (A) Mn                      (B) Cr  
(C) O                        (D) K

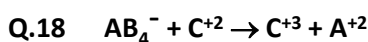
Q.16 Select the pair of oxidation processes,



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

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

(A)  $\text{CH}_4$     (B)  $\text{CCl}_4$     (C)  $\text{CF}_4$     (D)  $\text{CO}_2$



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)  $\text{NO}_2$

(B)  $\text{MnO}_2$

(C)  $\text{PbO}_2$

(D)  $\text{Na}_2\text{O}_2$

Q.20 The oxidation number of Pt in  $[\text{Pt}(\text{C}_2\text{H}_4)\text{Cl}_3]^-$  is

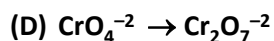
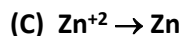
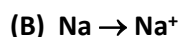
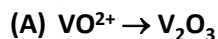
(A) +1

(B) +2

(C) +3

(D) +4

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



Q.22 Which one is correctly matched:

Substance	O.N. of S
(A) $\text{H}_2\text{S}$	+2
(B) $\text{H}_2\text{SO}_5$	+4
(C) $\text{H}_2\text{SO}_4$	+4
(D) $\text{Na}_2\text{S}_4\text{O}_6$	+2.5

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

- (A)  $\text{FeSO}_4 \cdot (\text{NH}_4)_2\text{SO}_4 \cdot 6\text{H}_2\text{O}$
- (B)  $\text{K}_4\text{Fe}(\text{CN})_6$
- (C)  $\text{Fe}(\text{CO})_5$
- (D)  $\text{K}_2\text{FeO}_4$

Q.24 Sulphur has lowest oxidation number in –

- (A)  $\text{H}_2\text{SO}_3$
- (B)  $\text{SO}_2$
- (C)  $\text{H}_2\text{SO}_4$
- (D)  $\text{H}_2\text{S}$

Q.25 Oxidation numbers of two Cl atoms in bleaching powder,  $\text{CaOCl}_2$  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)  $\text{Fe}^* + \text{CuSO}_4 \rightarrow \text{Cu} + \text{FeSO}_4$
- (B)  $\text{H}_2^* + \text{Cl}_2 \rightarrow 2\text{HCl}$
- (C)  $\text{C}^* + \text{H}_2\text{O} \rightarrow \text{CO} + \text{H}_2$
- (D)  $\text{Mn}^*\text{O}_2 + 4\text{HCl} \rightarrow \text{MnCl}_2 + \text{Cl}_2 + 2\text{H}_2\text{O}$

Q.27 Equivalent weight of  $\text{FeC}_2\text{O}_4$  in the change,

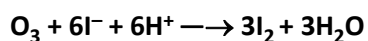


- (A)  $M/3$
- (B)  $M/6$
- (C)  $M/2$
- (D)  $M/1$

Q.28  $\text{H}_2\text{MoO}_4 \rightarrow \text{MoO}_2^+$  in the process  $\text{H}_2\text{MoO}_4 -$

- (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



equivalent weight of  $\text{O}_3$  (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  $\text{N}_2\text{H}_4$  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