DPP-1 [Oxidation number and Oxidation State]

Chapter: Redox Reactions

"Your goals need your time — not your excuses."

GROUP–1: Fundamental Rules & Direct Concepts

Q1. **Of the following elements, which one has the same oxidation state in all of its compounds?**

(1) Hydrogen
(2) Fluorine
(3) Carbon
(4) Oxygen

Q2. **Oxidation number of carbon in graphite is:**

(1) Zero
(2) +1
(3) +4
(4) +2

Q3. **The process in which oxidation number increases is :-**

(1) Reduction
(2) Hydrolysis
(3) Oxidation
(4) Decomposition

Q4. **Positive oxidation state of an element indicates that it is –**

(1) Elementary form
(2) Oxidised
(3) Reduced
(4) Only reductant

GROUP–2: Oxygen Special Cases (Peroxide / Superoxide / OF_2 / O_2F_2 etc.)

Q5. **Which statement is wrong:**

(1) Oxidation number of oxygen is +1 in peroxides
(2) Oxidation number of oxygen is +2 in oxygen difluoride
(3) Oxidation number of oxygen is –1/2 in superoxides
(4) Oxidation number of oxygen is –2 in most of its compounds

Q6. **Oxidation state of oxygen in hydrogen peroxide is:**

(1) –1
(2) +1
(3) 0
(4) –2

Q7. **Select the compound in which the oxidation number of oxygen is –1:** **(Repeat)**

(1) H_2O
(2) O_2F_2
(3) Na_2O
(4) BaO_2

Q8. **Oxidation number of fluorine in OF_2 is:**
(1) +1
(2) +2
(3) –1
(4) –2

Q9. **Oxidation state of oxygen in H_2O_2 and OF_2 is :-** **(Repeat)**
(1) +1, –1
(2) +2, +1
(3) –2, +2
(4) –1, +2

Q10. **The oxidation state of oxygen atom in potassium superoxide is –** **(Repeat)**
(1) Zero
(2) –1/2
(3) –1
(4) –2

Q11. **Oxidation number of oxygen atom in O_3 molecule is :-**
(1) 0
(2) –2
(3) +2
(4) –1/2

GROUP–3: Carbon Oxidation Number (Organic / Inorganic / Multiple C)

Q12. **The oxidation number of C in CH_4, CH_3Cl, $CHCl_3$, $CHCl_2$, $CHCl_3$ and CCl_4 are respectively:**
(1) +4, +2, 0, –2, –4
(2) +2, +4, 0, –4, –2
(3) –4, –2, 0, +2, +4
(4) –2, –4, 0, +4, +2

Q13. **The sum of oxidation states of all the carbon atoms present in the compound C_6H_5CHO is:**
(1) –4
(2) 3
(3) +5
(4) –4/7

Q14. **The oxidation number of C marked as (1) and (2) in the compound O=C=C=C=O are respectively:**
(1) 2, 0
(2) 0, 2
(3) 2, 2
(4) 2, 4

GROUP–4: Nitrogen Oxidation Number (NH_2OH / Azide / Ordering / Match)

Q15. The oxidation number of nitrogen in NH_2OH is:

(1) 0
(2) +1
(3) –1
(4) –2

Q16. –1/3 oxidation state of nitrogen will be obtained in case of:

(1) Ammonia
(2) Hydrazoic acid
(3) Nitric oxide
(4) N_2O

Q17. Oxidation number of 'N' in N_3H (hydrazoic acid) is:

(1) –1/3
(2) –3
(3) +3
(4) +2/3

Q18. The oxidation number of N in $(NH_4)_2SO_4$ is:

(1) 3
(2) –3
(3) 0
(4) 1

Q19. Oxidation state of nitrogen is incorrectly given for:

(1) $[Co(NH_3)_5Cl]Cl_2 \rightarrow -3$
(2) $NH_2OH \rightarrow -1$
(3) $(NH_4)_2SO_4 \rightarrow +3$
(4) $Mg_3N_2 \rightarrow -3$

Q20. Match List–I (compound) with List–II (oxidation state of N):

List–I: (A) KNO_3 (B) HNO_2 (C) NH_4Cl (D) NaN_3
List–II: (a) –1/3 (b) –3 (c) 0 (d) +3 (e) +5

(1) e, d, b, a
(2) e, b, d, a
(3) e, b, a, c
(4) d, b, e, c

Q21. The correct order of N–compounds in its decreasing order of oxidation states is :- [NEET–2018]

(1) HNO_3, NO, N_2, NH_4Cl
(2) HNO_3, NO, NH_4Cl, N_2
(3) NH_4Cl, N_2, NO, HNO_3
(4) HNO_3, NH_4Cl, NO, N_2

Q22. In which of the following compounds, nitrogen exhibits highest oxidation state? [AIPMT–2012] **(Repeat)**

(1) N_3H
(2) NH_2OH

(3) N_2H_4
(4) NH_3

GROUP–5: Phosphorus / Arsenic / General Oxidation-State Range

Q23. The oxidation states of phosphorus vary from :-
(1) –3 to +5
(2) –1 to +1
(3) –3 to +3
(4) –5 to +1

Q24. The oxidation number of phosphorus in PH_4^+, PO_3^{2-} and PO_4^{3-} are respectively:
(1) –3, +1, +3
(2) –3, +5, +1
(3) +3, –3, +5
(4) –3, +1, +5

Q25. Oxidation number of P in KH_2PO_3 is:
(1) –1
(2) –3
(3) +5
(4) +3

Q26. The oxidation number of phosphorus in $Ba(H_2PO_2)_2$ is :-
(1) +3
(2) +2
(3) +1
(4) –1

Q27. Oxidation states of P in $H_4P_2O_5$, $H_4P_2O_8$, $H_4P_2O_7$ are respectively :- [AIPMT–2010]
(1) +3, +5, +4
(2) +5, +3, +4
(3) +5, +4, +3
(4) +3, +4, +5

Q28. The oxidation number of arsenic atom in H_3AsO_4 is:
(1) –1
(2) –3
(3) +3
(4) +5

Q29. In substance $Mg(HXO_3)$ the oxidation number of X is:
(1) 0
(2) +2
(3) +3
(4) +4

GROUP–6: Sulphur Oxidation Number & Ordering (Thiosulphate / Persulphate etc.)

Q30. Oxidation number of sulphur in $Na_2S_2O_3$ would be:
(1) +2
(2) +4

(3) –2
(4) 0

Q31. Which of the following compounds are arranged in increasing oxidation number of S:
(1) H_2SO_3, H_2S, H_2SO_4, $H_2S_2O_3$
(2) H_2S, H_2SO_3, $H_2S_2O_3$, H_2SO_4
(3) H_2S, H_2SO_3, H_2SO_4, $H_2S_2O_3$
(4) H_2S, $H_2S_2O_3$, H_2SO_3, H_2SO_4

Q32. The sum of oxidation states of sulphur in $H_2S_2O_8$ is:
(1) +2
(2) +6
(3) +7
(4) +12

Q33. The oxidation states of sulphur in the anions SO_3^{2-}, $S_2O_4^{2-}$ and $S_2O_6^{2-}$ follow the order :-
(1) $S_2O_4^{2-} < SO_3^{2-} < S_2O_6^{2-}$
(2) $SO_3^{2-} < S_2O_4^{2-} < S_2O_6^{2-}$
(3) $S_2O_6^{2-} < S_2O_4^{2-} < SO_3^{2-}$
(4) $S_2O_6^{2-} < SO_3^{2-} < S_2O_4^{2-}$

GROUP–7: Halogens / Iodine / Chlorine / Bromine & Related Oxoanions

Q34. In the conversion of Br_2 to BrO_3^- the oxidation state of bromine changes from:
(1) 0 to 5
(2) 1 to 5
(3) 0 to –3
(4) 2 to 5

Q35. Chlorine is in +3 oxidation state in :-
(1) HCl
(2) $HClO_4$
(3) ICl
(4) ClF_3

Q36. Iodine shows the highest oxidation state in the compound:
(1) KI
(2) KI_3
(3) IF_5
(4) KIO_4

Q37. The oxidation state of iodine in $H_4I\ O_6$ is:
(1) +7
(2) –1
(3) +5
(4) +1

GROUP–8: Chromium / Manganese & Oxidation-State Changes

Q38. In which of the following compounds of Cr, the oxidation number of Cr is not +6:
(1) CrO_3

(2) CrO_2Cl_2
(3) Cr_2O_3
(4) $K_2Cr_2O_7$

Q39. Each chromium in $K_2Cr_2O_7 \rightarrow Cr_2O_3$ is changing from :-

(1) +6 to +12
(2) +12 to +6
(3) +6 to +3
(4) None of these

Q40. Amongst the following, identify the species with an atom in +6 oxidation state:

(1) MnO_4^-
(2) $Cr(CN)_6^{3-}$
(3) NiF_6^{2-}
(4) CrO_2Cl_2

GROUP–9: Coordination Compounds & Transition Metals (Ni/Pt/Co/Fe etc.)

Q41. In $[Ni(CO)_4]$, the oxidation state of Ni is:

(1) 4
(2) 0
(3) 2
(4) 8

Q42. The oxidation number of Pt in $[Pt(C_2H_4)Cl_3]^-$ is:

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

Q43. Oxidation state of cobalt in $[Co(NH_3)_4(H_2O)Cl]SO_4$ is:

(1) 0
(2) +4
(3) –2
(4) +3

Q44. The oxidation number of iron in potassium ferricyanide $K_3[Fe(CN)_6]$ is:

(1) Two
(2) Six
(3) Three
(4) Four

Q45. In which of the following compounds iron has lowest oxidation state:

(1) $FeSO_4(NH_4)_2SO_4 \cdot 6H_2O$
(2) $K_4[Fe(CN)_6]$
(3) $[Fe(CO)_5]$
(4) $Fe_{0.94}O$

Q46. The correct code for the O.N. of asterisked atom would be:

(A) KMn^*O_4 (B) $Ni^*(CO)_4$ (C) $[Pt^*(NH_3)Cl_2]Cl_2$ (D) Na_2O_2

(1) +4
(2) +7

(3) 0
(4) –1

Q47. Oxidation number of Fe in $Fe_{0.94}O$ is:
(1) 200
(2) 200/94
(3) 94/200
(4) None

Q48. Oxidation number of Fe in Fe_3O_4 are:
(1) +2 and +3
(2) –1 and +2
(3) +1 and +3
(4) None

Q49. Oxidation number of Fe in Fe_3O_4 is :- **(Repeat)**
(1) $\frac{5}{4}$
(2) $\frac{4}{5}$
(3) $\frac{3}{2}$
(4) $\frac{8}{3}$

Q50. In which of the following pair oxidation number of Fe is same:
(1) $K_3[Fe(CN)_6]$, Fe_2O_3
(2) $Fe(CO)_5$, Fe_2O_3
(3) Fe_2O_3, FeO
(4) $Fe_2(SO_4)_3$, $K_4[Fe(CN)_6]$

Q51. Compound $YBa_2Cu_3O_7$ is a superconductor. The O.N. of the copper in the compound will be:
(1) +7/3
(2) Zero
(3) +2
(4) +1

GROUP–10: Sodium / Other Miscellaneous Oxidation Numbers

Q52. Oxidation number of sodium in sodium amalgam is:
(1) +2
(2) +1
(3) –3
(4) Zero

Q53. Oxidation number of Xe in XeF_5 is :-
(1) +1
(2) +2
(3) +3
(4) +4

Q54. Oxidation numbers of P in PO_4^{3-}, of S in SO_4^{2-} and that of Cr in $Cr_2O_7^{2-}$ are respectively :- [AIPMT–2009] **(Repeat)**
(1) +3, +6, +5
(2) +5, +3, +6
(3) –3, +6, +6

(4) +5, +6, +6

Q55. Which one of the following statements is not correct?

(1) Oxidation state of S in $(NH_4)_2S_2O_8$ is +6

(2) Oxidation number of Os in OsO_4 is +8

(3) Oxidation state of S in H_2SO_5 is +8

(4) Oxidation number of O in KO_2 is –1/2

Q56. Oxidation number of C in HNC is:

(1) +2

(2) –3

(3) +3

(4) Zero

Q57. Oxidation number of carbon in carbon suboxide (C_3O_2) is:

(1) +2/3

(2) +4/3

(3) +4

(4) –4/3

Q58. Two oxidation states for chlorine are found in the compound:

(1) $CaOCl_2$

(2) KCl

(3) $KClO_3$

(4) Cl_2O_7

Q59. Oxidation number of chlorine in perchloric acid is :-

(1) +1

(2) +3

(3) +5

(4) +7

Q60. Lowest oxidation state of phosphorous is in :-

(1) H_3PO_2

(2) H_3PO_4

(3) $H_4P_2O_7$

(4) H_3PO_3

Q61. Predict the highest and lowest oxidation state of (a) Ti and (b) Tl in combined state.

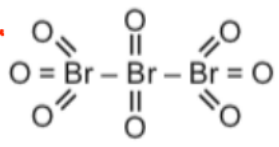
(1) a[0,+3] b[0,+2]

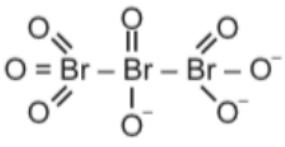
(2) a[+3,0] b[+4,0]

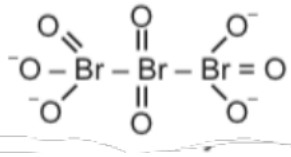
(3) a[+4,0] b[+2,0]

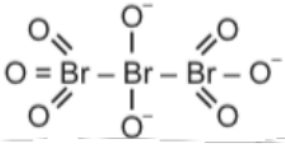
(4) a[+4,+2] b[+3,+1]

Q62. The correct structure of tribromooctaoxide is :- [NEET–2019]

(1) 

(2) 

(3) 

(4) 

Q63. **Oxidation number of Cr in CrO_5 is :-**

(1) +10
(2) +6
(3) +4
(4) +5

Q64. **In acidic medium, H_2O_2 changes $Cr_2O_7^{2-}$ to CrO_5 which has two (–O–O–) bonds. Oxidation state of Cr in CrO_5 is :-** **(Repeat)**

(1) +5
(2) +3
(3) +6
(4) –10

Q65. **The oxidation state of Cr in CrO_6 is :- [NEET–2019 Odisha]**

(1) +4
(2) –6
(3) +12
(4) +6

Q66. **Oxidation state of iron in haemoglobin is :-**

(1) 0
(2) +2
(3) –2
(4) +3

Q67. **The brown ring complex compound is formulated as $[Fe(H_2O)_5NO]SO_4$. The oxidation state of iron is :-**

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

Q68. **Which of the following processes does not involve oxidation of iron? [AIPMT–2015]**

(1) Liberation of H_2 from steam by iron at high temperature
(2) Rusting of iron sheets
(3) Decolourisation of blue $CuSO_4$ solution by iron
(4) Formation of $Fe(CO)_5$ from Fe