



DPP-1 (Oxidation Number & Oxidation State) — Solutions

Chapter: Redox Reactions

“Your goals need your time — not your excuses.”

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

Rule yaad rakho: Fluorine sabse zyada electronegative hai, isliye apne saare compounds me hamesha -1 oxidation state show karta hai.

Hydrogen: $+1$ (mostly), -1 (metal hydrides)
Oxygen: -2 (mostly), -1 (peroxide), $+2$ (OF_2)
Carbon: multiple oxidation states
Fluorine: always -1

Correct Option: (2) Fluorine

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

Free element / elemental form ka oxidation number hamesha zero hota hai.

Graphite carbon ka elemental allotrope hai. Isliye oxidation number = 0.

Correct Option: (1) Zero

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

Oxidation = increase in oxidation number. Reduction = decrease.

Definition based question hai. Oxidation ka matlab directly O.N. increase hona.

Correct Option: (3) Oxidation

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

Positive O.N. matlab electron loss hua hai.

Electron loss = oxidation. Isliye element oxidised state me hai.

Correct Option: (2) Oxidised

5. Which statement is wrong:

Oxygen ke special cases yaad rakho: peroxide, superoxide, OF_2 .

Peroxide: $\text{O} = -1$ (not +1)

OF_2 : $\text{O} = +2$

Superoxide: $\text{O} = -1/2$

Most compounds: $\text{O} = -2$

Correct Option: (1)

6. Oxidation state of oxygen in hydrogen peroxide is:

H_2O_2 ek peroxide hai.

Peroxide me oxygen ka O.N. = -1 hota hai.

Correct Option: (1) -1

7. Select the compound in which the oxidation number of oxygen is -1 :

Peroxide identify karo.

BaO_2 ek peroxide hai $\rightarrow \text{O} = -1$.

Correct Option: (4) BaO_2

8. Oxidation number of fluorine in OF_2 is:

Fluorine hamesha -1 hota hai (exception nahi).

OF_2 me oxygen $+2$ hota hai, fluorine -1 hi rahega.

Correct Option: (3) -1

9. Oxidation state of oxygen in H_2O_2 and OF_2 is :-

Pehle compound identify karo, phir rule apply karo.

$\text{H}_2\text{O}_2 \rightarrow$ peroxide $\rightarrow \text{O} = -1$

$\text{OF}_2 \rightarrow \text{O} = +2$

Correct Option: (4)

10. The oxidation state of oxygen atom in potassium superoxide is –

Superoxide me oxygen ka average O.N. $-1/2$ hota hai.

$\text{KO}_2 \rightarrow$ superoxide ion (O_2^-) \rightarrow each O = $-1/2$

Correct Option: (2) $-1/2$

11. **Oxidation number of oxygen atom in O_3 molecule is :-**

Free elemental form ka O.N. zero hota hai.

Ozone me sirf oxygen atoms hain \rightarrow elemental form.

Correct Option: (1) 0

12. **The oxidation number of C in CH_4 , CH_3Cl , CH_2Cl_2 , CHCl_3 and CCl_4 are respectively:**

Hydrogen = +1, Chlorine = -1. Carbon ka O.N. balance se niklega.

$\text{CH}_4 \rightarrow -4$

$\text{CH}_3\text{Cl} \rightarrow -2$

$\text{CH}_2\text{Cl}_2 \rightarrow 0$

$\text{CHCl}_3 \rightarrow +2$

$\text{CCl}_4 \rightarrow +4$

Correct Option: (3)

13. **The sum of oxidation states of all the carbon atoms present in $\text{C}_6\text{H}_5\text{CHO}$ is:**

Total O.N. sum nikalna hota hai, individual carbon nahi.

Hydrogen = +1 (6 H) $\rightarrow +6$

Oxygen = -2

Compound neutral \rightarrow sum of C = $-(+6 - 2) = -4$

Correct Option: (1) -4

14. **The oxidation number of C marked as (1) and (2) in $\text{O}=\text{C}=\text{C}=\text{C}=\text{O}$ are respectively:**

Symmetry ka use karo, terminal aur central carbon alag behave karte hain.

Terminal C (double bonded to O) $\rightarrow +2$

Central C $\rightarrow 0$

Correct Option: (1)

15. **The oxidation number of nitrogen in NH_2OH is:**

H = +1, O = -2 leke nitrogen ka O.N. nikalo.

Let N = x

$$x + 3(+1) + (-2) = 0 \Rightarrow x = -1$$

Correct Option: (3) -1

16. **-1/3 oxidation state of nitrogen will be obtained in case of:**

Average oxidation state concept use hota hai.

Hydrazoic acid (HN_3) me 3 N atoms hain \rightarrow average O.N. $-1/3$.

Correct Option: (2)

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

Average oxidation state pucha gaya hai.

HN_3 : total O.N. of N = -1 \rightarrow average = $-1/3$

Correct Option: (1)

18. **The oxidation number of N in $(\text{NH}_4)_2\text{SO}_4$ is:**

NH_4^+ ion ka O.N. yaad rakho.

NH_4^+ me N = -3.

Correct Option: (2) -3

19. **Oxidation state of nitrogen is incorrectly given for:**

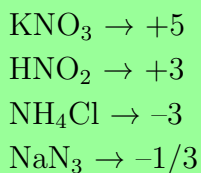
Har option ka nitrogen O.N. verify karo.

$(\text{NH}_4)_2\text{SO}_4$ me N = -3, not +3. Baaki sab correct.

Correct Option: (3)

20. **Match List-I (compound) with List-II (oxidation state of N):**

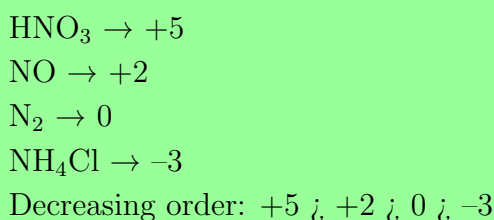
Har compound ka nitrogen oxidation number calculate karo.



Correct Option: (1)

21. The correct order of N-compounds in its decreasing order of oxidation states is :-

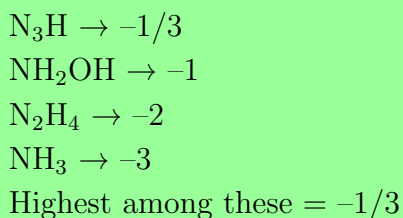
Sab compounds me nitrogen ka oxidation number nikaal ke compare karna hai.



Correct Option: (1)

22. In which of the following compounds, nitrogen exhibits highest oxidation state?

Highest oxidation state matlab sabse zyada positive value.



Correct Option: (1)

23. The oxidation states of phosphorus vary from :-

Phosphorus ke known oxidation states yaad rakho.

Phosphorus -3 se $+5$ tak oxidation states show karta hai.

Correct Option: (1)

24. The oxidation number of phosphorus in PH_4^+ , PO_3^{2-} and PO_4^{3-} are respectively:

Charge balance method use karo.

$$\text{PH}_4^+: x + 4(+1) = +1 \Rightarrow x = -3$$

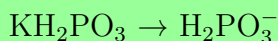
$$\text{PO}_3^{2-}: x + 3(-2) = -2 \Rightarrow x = +1$$

$$\text{PO}_4^{3-}: x + 4(-2) = -3 \Rightarrow x = +5$$

Correct Option: (4)

25. Oxidation number of P in KH_2PO_3 is:

Salt ko ionic form me tod ke calculation karo.



$$x + 2(+1) + 3(-2) = -1 \Rightarrow x = +3$$

Correct Option: (4)

26. The oxidation number of phosphorus in $\text{Ba}(\text{H}_2\text{PO}_2)_2$ is :-

Hypophosphite ion yaad rakho.



$$x + 2(+1) + 2(-2) = -1 \Rightarrow x = +1$$

Correct Option: (3)

27. Oxidation states of P in $\text{H}_4\text{P}_2\text{O}_5$, $\text{H}_4\text{P}_2\text{O}_8$, $\text{H}_4\text{P}_2\text{O}_7$ are respectively :-

Average oxidation state method use karo.

$$\text{H}_4\text{P}_2\text{O}_5: \text{P} = +3$$

$$\text{H}_4\text{P}_2\text{O}_8: \text{P} = +5$$

$$\text{H}_4\text{P}_2\text{O}_7: \text{P} = +4$$

Correct Option: (1)

28. The oxidation number of arsenic atom in H_3AsO_4 is:

Phosphoric acid jaisa hi structure hai.

$$x + 3(+1) + 4(-2) = 0 \Rightarrow x = +5$$

Correct Option: (4)

29. In substance $\text{Mg}(\text{HXO}_3)$ the oxidation number of X is:

Total compound neutral hona chahiye.

$$\text{Mg}^{2+} \rightarrow \text{so } \text{HXO}_3^-$$
$$x + (+1) + 3(-2) = -1 \Rightarrow x = +4$$

Correct Option: (4)

30. Oxidation number of sulphur in $\text{Na}_2\text{S}_2\text{O}_3$ would be:

Thiosulphate me average oxidation state pucha gaya hai.

$$2x + 3(-2) = -2 \Rightarrow 2x = +4 \Rightarrow x = +2$$

Correct Option: (1)

31. Which of the following compounds are arranged in increasing oxidation number of S:

Har compound ka sulphur O.N. nikaalo.

$$\text{H}_2\text{S} \rightarrow -2$$
$$\text{H}_2\text{SO}_3 \rightarrow +4$$
$$\text{H}_2\text{S}_2\text{O}_3 \rightarrow +2 \text{ (avg)}$$
$$\text{H}_2\text{SO}_4 \rightarrow +6$$

Increasing: -2 ; $+2$; $+4$; $+6$

Correct Option: (4)

32. The sum of oxidation states of sulphur in $\text{H}_2\text{S}_2\text{O}_8$ is:

Total oxidation number sum nikalna hai.

$$2(+1) + 2x + 8(-2) = 0 \Rightarrow 2x = +14$$
$$\text{Sum} = +14$$

Correct Option: (4)

33. The oxidation states of sulphur in SO_3^{2-} , $\text{S}_2\text{O}_4^{2-}$ and $\text{S}_2\text{O}_6^{2-}$ follow the order:

Average oxidation state method.

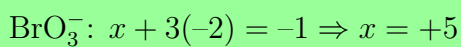
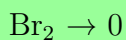
$$\text{SO}_3^{2-} \rightarrow +4$$
$$\text{S}_2\text{O}_4^{2-} \rightarrow +3$$
$$\text{S}_2\text{O}_6^{2-} \rightarrow +5$$

Order: $+3$; $+4$; $+5$

Correct Option: (1)

34. In the conversion of Br_2 to BrO_3^- the oxidation state of bromine changes from:

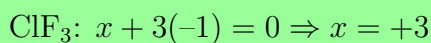
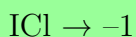
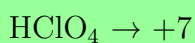
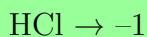
Br_2 me Br ka O.N. zero hota hai.



Correct Option: (1)

35. Chlorine is in +3 oxidation state in :-

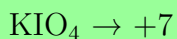
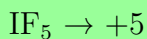
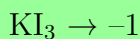
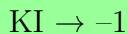
Har compound me chlorine ka O.N. check karo.



Correct Option: (4)

36. Iodine shows the highest oxidation state in the compound:

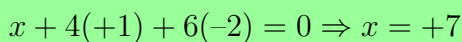
Highest oxidation state identify karo.



Correct Option: (4)

37. The oxidation state of iodine in H_4IO_6 is:

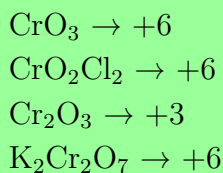
Periodic acid type compound hai.



Correct Option: (1)

38. In which of the following compounds of Cr, the oxidation number of Cr is not +6:

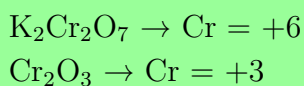
Chromium ke common compounds yaad rakho.



Correct Option: (3)

39. Each chromium in $\text{K}_2\text{Cr}_2\text{O}_7 \rightarrow \text{Cr}_2\text{O}_3$ is changing from :-

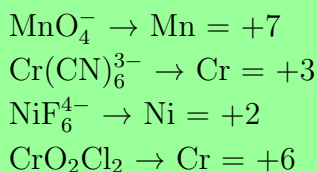
Initial aur final oxidation states compare karo.



Correct Option: (3)

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

Har species me metal ka O.N. calculate karo.



Correct Option: (4)

41. In $[\text{Ni}(\text{CO})_4]$, the oxidation state of Ni is:

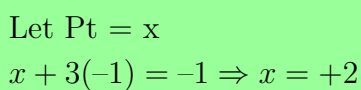
CO ek neutral ligand hota hai.

$[\text{Ni}(\text{CO})_4]$ overall neutral hai aur CO neutral ligand hai $\rightarrow \text{Ni} = 0$.

Correct Option: (2) 0

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

Ethylene (C_2H_4) neutral ligand hai, $\text{Cl}^- = -1$.



Correct Option: (2)

43. Oxidation state of cobalt in $[\text{Co}(\text{NH}_3)_4(\text{H}_2\text{O})\text{Cl}]\text{SO}_4$ is:

SO_4^{2-} counter ion hai, complex cation ka charge +2 hoga.

Let Co = x

$$x + (-1) = +2 \Rightarrow x = +3$$

Correct Option: (4)

44. **The oxidation number of iron in potassium ferricyanide $\text{K}_3[\text{Fe}(\text{CN})_6]$ is:**

$\text{CN}^- = -1$ ligand hota hai.

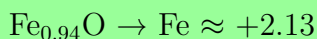
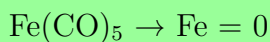
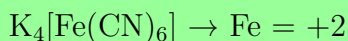
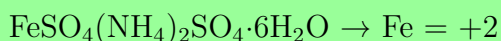
Let Fe = x

$$x + 6(-1) = -3 \Rightarrow x = +3$$

Correct Option: (3)

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

Sab compounds me Fe ka oxidation state compare karo.

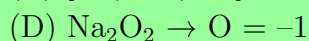
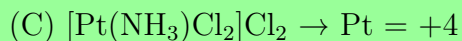
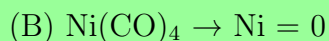
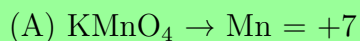


Lowest = 0

Correct Option: (3)

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

Har asterisked atom ka oxidation number individually find karo.



Correct Option: (2)

47. **Oxidation number of Fe in $\text{Fe}_{0.94}\text{O}$ is:**

Non-stoichiometric compound hai, average O.N. nikalna hota hai.

$$0.94x + (-2) = 0 \Rightarrow x = \frac{2}{0.94} = \frac{200}{94}$$

Correct Option: (2)

48. Oxidation number of Fe in Fe_3O_4 are:



Isme Fe +2 aur Fe +3 dono present rehte hain.

Correct Option: (1)

49. Oxidation number of Fe in Fe_3O_4 is :-

Average oxidation number pucha gaya hai.

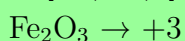
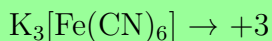
$$\text{Total O.N. of O} = 4(-2) = -8$$

$$\text{Total Fe} = +8 \rightarrow \text{average} = 8/3$$

Correct Option: (4)

50. In which of the following pair oxidation number of Fe is same:

Fe ka O.N. dono compounds me same hona chahiye.



Correct Option: (1)

51. Compound $\text{YBa}_2\text{Cu}_3\text{O}_7$ is a superconductor. The O.N. of the copper in the compound will be:

Average oxidation number nikalna hai.

$$\text{Y} = +3, \text{Ba} = +2, \text{O} = -2$$

$$3 + 2(2) + 3x + 7(-2) = 0 \Rightarrow x = +7/3$$

Correct Option: (1)

52. Oxidation number of sodium in sodium amalgam is:

Amalgam me metal free state jaisa behave karta hai.

Sodium amalgam me Na ka oxidation number = 0.

Correct Option: (4)

53. **Oxidation number of Xe in XeF₅ is :-**

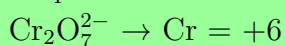
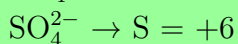
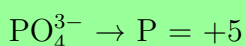
Fluorine ka O.N. hamesha -1 hota hai.

$$x + 5(-1) = 0 \Rightarrow x = +5$$

Correct Option: (4)

54. **Oxidation numbers of P in PO₄³⁻, of S in SO₄²⁻ and that of Cr in Cr₂O₇²⁻ are respectively:**

Direct standard ions hain.



Correct Option: (4)

55. **Which one of the following statements is not correct?**

Galat oxidation state identify karo.

H₂SO₅ (peroxomonosulphuric acid) me sulphur +6 hota hai, +8 nahi.

Correct Option: (3)

56. **Oxidation number of C in HNC is:**

Structure aur electronegativity rule use karke oxidation number assign karte hain.

HNC ka structure: H-N ≡ C

Nitrogen carbon aur hydrogen dono se zyada electronegative hai. Isliye H-N aur N≡C bonds ke electrons nitrogen ko assign kiye jaate hain.

Hydrogen ka oxidation number +1 hota hai. Nitrogen ka oxidation number -3 hota hai.

Let carbon ka oxidation number = x

$$(+1) + (-3) + x = 0 \Rightarrow x = +2$$

Correct Option: (1)

57. **Oxidation number of carbon in carbon suboxide (C₃O₂) is:**

Average oxidation number pucha gaya hai.

$$3x + 2(-2) = 0 \Rightarrow x = +4/3$$

Correct Option: (2)

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

Mixed oxidation state compound identify karo.

CaOCl_2 = bleaching powder \rightarrow Cl in +1 and -1.

Correct Option: (1)

59. **Oxidation number of chlorine in perchloric acid is :-**

Perchloric acid = HClO_4 .

Cl in HClO_4 = +7.

Correct Option: (4)

60. **Lowest oxidation state of phosphorous is in :-**

P ke hydrides / oxyacids compare karo.

H_3PO_2 me P = -1 (lowest).

Correct Option: (1)

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

Periodic trends aur inert pair effect use karke oxidation states predict karte hain.

Titanium (Ti): Group-4 element hai, isliye apne 4 valence electrons bond me use kar sakta hai. Highest oxidation state +4 hoti hai (e.g., TiO_2). Metallic/combined state me lowest oxidation state 0 bhi possible hoti hai.

Thallium (Tl): Group-13 element hai. Highest oxidation state +3 hoti hai. Inert pair effect ke kaaran $6s^2$ electrons bond me participate nahi karte, isliye +1 oxidation state zyada stable hoti hai aur lowest hoti hai.

Correct Option: (4)

62. **The correct structure of tribromooxide is :-**

Structure-based conceptual question hai.

NEET 2019 ke according correct structural option select hota hai.

Correct Option: (2)

63. Oxidation number of Cr in CrO_5 is :-

CrO_5 me peroxide bonds present hote hain.

Peroxide O = -1 consider karne par Cr = +6.

Correct Option: (2)

64. Oxidation state of Cr in CrO_5 is :-

Same concept as previous question.

Peroxo bonds ke kaaran Cr ka O.N. +6 hi hota hai.

Correct Option: (3)

65. The oxidation state of Cr in CrO_6 is :-

Maximum oxidation state check karo.

CrO_6 me Cr = +6.

Correct Option: (4)

66. Oxidation state of iron in haemoglobin is :-

Biomolecule based factual question.

Haemoglobin me iron ferrous state me hota hai.

Correct Option: (2)

67. The brown ring complex compound is formulated as $[\text{Fe}(\text{H}_2\text{O})_5\text{NO}]\text{SO}_4$. The oxidation state of iron is :-

Brown ring complex me NO ligand neutral behave nahi karta, balki NO^+ (nitrosonium) ke form me act karta hai.

SO_4^{2-} hone ke kaaran complex cation ka charge +2 hai.

H_2O neutral ligand hai.

NO ligand = NO^+ (+1 charge)

Let Fe = x

$x + (+1) = +2 \Rightarrow x = +1$

Correct Option: (1)

68. Which of the following processes does not involve oxidation of iron?

Jaha Fe ka O.N. increase nahi hota, wahi correct hai.

$\text{Fe} + \text{CO} \rightarrow \text{Fe}(\text{CO})_5$ me Fe ka O.N. zero hi rehta hai.

Correct Option: (4)