PRE-MEDICAL

PHYSICAL CHEMISTRY

ENTHUSIAST | LEADER | ACHIEVER

EXERCISE

Redox Reaction

ENGLISH MEDIUM

EXERCISE-I (Conceptual Questions) — Build Up Your Understanding

OXIDATION NUMBER

1. In $[Ni(CO)_4]$, the oxidation state of Ni is :
(1) 4 (2) 0 (3) 2 (4) 8
RR0001

2. The oxidation number of nitrogen in NH_2OH is :
(1) 0 (2) +1 (3) –1 (4) –2
RR0002

3. Of the following elements, which one has the same oxidation state in all of its compounds ?
(1) Hydrogen (2) Fluorine
(3) Carbon (4) Oxygen
RR0003

4. Oxidation number of fluorine in OF_2 is :
(1) +1 (2) +2 (3) –1 (4) –2
RR0004

5. The oxidation number of C in CH_4, CH_3Cl, CH_2Cl_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
RR0005

6. Phosphorus has the oxidation state of +3 in :
(1) Ortho phosphoric acid
(2) Phosphorus acid
(3) Meta phosphoric acid
(4) Pyrophosphoric acid
RR0006

7. Oxidation state of oxygen in hydrogen peroxide is
(1) –1 (2) +1 (3) 0 (4) –2
RR0007

8. 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 $-\frac{1}{2}$
RR0009

9. Which of the following shows highest oxidation number in combined state :
(1) Os (2) Ru
(3) Both (1) and (2) (4) None
RR0010

10. Oxidation number of sodium in sodium amalgam(Na-Hg) is :
(1) +2 (2) +1 (3) –3 (4) Zero
RR0011

11. Oxidation number of C in HNC is :
(1) +2 (2) –3 (3) +3 (4) Zero
RR0013

12. Oxidation number of Fe in $Fe_{0.94}O$ is :
(1) 200 (2) 200/94
(3) 94/200 (4) None
RR0014

13. Oxidation number of carbon in carbon suboxide (C_3O_2) is :
(1) $\frac{+2}{3}$ (2) $\frac{+4}{3}$ (3) +4 (4) $\frac{-4}{3}$
RR0015

14. Oxidation number of sulphur in $Na_2S_2O_3$ would be :-
(1) +2 (2) +4 (3) –2 (4) 0
RR0016

15. Two oxidation states for chlorine are found in the compound :
(1) $CaOCl_2$ (2) KCl (3) $KClO_3$ (4) Cl_2O_7
RR0017

16. –1/3 oxidation state of nitrogen will be obtained in case of :
(1) Ammonia (NH_3)
(2) Hydrazoic acid (N_3H)
(3) Nitric oxide (NO)
(4) Nitrous oxide (N_2O)
RR0019

17. Compound $YBa_2Cu_3O_7$ is a super conductor. The O.N. of the copper in the compound will be:[O.No. of Y= +3]
(1) +7/3 (2) zero (3) +2 (4) +1
RR0021

18. The oxidation state of iodine in $H_4IO_6^-$ is :-
(1) +7 (2) –1 (3) +5 (4) +1
RR0022

19. 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
RR0023

20. The oxidation state of + 1 for phosphorous is found in:-
(1) Phosphorous acid (H_3PO_3)
(2) Orthophosphoric acid (H_3PO_4)
(3) Hypo phosphorous acid (H_3PO_2)
(4) Hypo phosphoric acid ($H_4P_2O_6$)

RR0024

21. In which of the following compounds iron has lowest oxidation state:-
(1) $FeSO_4(NH_4)_2SO_4.6H_2O$
(2) $K_4[Fe(CN)_6]$
(3) $[Fe(CO)_5]$
(4) $Fe_{0.94}O$

RR0025

22. Select the compound in which the oxidation number of oxygen is –1:-
(1) H_2O (2) O_2F_2
(3) Na_2O (4) BaO_2

RR0026

23. Match List - I (compound) with list - II (Oxidation state of N) and select the correct answer using the codes given below the list:-

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

Codes are:-

	A	B	C	D
(1)	e	d	b	a
(2)	e	b	d	a
(3)	d	e	a	c
(4)	b	c	d	e

RR0027

24. 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) $Fe_2(SO_4)_3$, $K_4[Fe(CN)_6]$

RR0028

25. 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

RR0029

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

RR0030

27. 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) $K_2Cr_2O_7$

RR0031

28. Oxidation state of cobalt in $[Co(NH_3)_4(H_2O)Cl]SO_4$ is
(1) 0 (2) +4 (3) –2 (4) +3

RR0032

29. Oxidation number of carbon in graphite is :-
(1) Zero (2) +1 (3) +4 (4) +2

RR0033

30. Oxidation number of 'N' in N_3H (hydrazoic acid) is :-
(1) $-\frac{1}{3}$ (2) –3 (3) +3 (4) $+\frac{2}{3}$

RR0034

31. Which of the following doesn't have +5 oxidation state of phosphorus ?
(1) Phosphorus acid (H_3PO_3)
(2) Orthophosphoric acid (H_3PO_4)
(3) Meta phosphoric acid (HPO_3)
(4) Pyro phosphoric acid ($H_4P_2O_7$)

RR0035

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

RR0036

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

RR0037

34. The oxidation number of phosphorus in PH_4^+, PO_2^{3-}, PO_4^{3-} and PO_3^{3-} are respectively :–
(1) –3, +1, +3, +5 (2) –3, +3, +5, +1
(3) +3, –3, +5, +1 (4) –3, +1, +5, +3

RR0040

35. 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) $H_2S_2O_3$, H_2SO_3, H_2S, 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

RR0041

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

RR0042

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

RR0043

APPLICATIONS OF REDOX REACTIONS

38. A reducing agent is a substance which can :
(1) Accept electrons (2) Donate electrons
(3) Accept protons (4) Donate protons
RR0045

39. The reaction $H_2S + H_2O_2 \rightarrow S + 2H_2O$ manifests :
(1) Oxidising action of H_2O_2
(2) Reducing nature of H_2O_2
(3) Acidic nature of H_2O_2
(4) Alkaline nature of H_2O_2
RR0046

40. If an element is in its lowest oxidation state, under proper conditions it can act as :
(1) Reducing agent
(2) An oxidising agent
(3) Oxidising as well as reducing agent
(4) Neither oxidising nor reducing agent
RR0047

41. In a reaction of
H_2O (steam) + C (red hot) $\rightarrow$ CO + H_2
(1) H_2O is the reducing agent
(2) H_2O is the oxidising agent
(3) carbon is the oxidising agent
(4) oxidation-reduction does not occur
RR0048

42. The compound that can work both as an oxidising as well as reducing agent is :
(1) $KMnO_4$ (2) H_2O_2
(3) $Fe_2(SO_4)_3$ (4) $K_2Cr_2O_7$
RR0049

43. HNO_2 acts as an oxidant with which one of the following reagent:-
(1) $KMnO_4$ (2) H_2S (3) $K_2Cr_2O_7$ (4) Br_2
RR0051

44. In which of the following reaction H_2O_2 acts as reducing agent :-
(1) $2FeCl_2 + 2HCl + H_2O_2 \rightarrow 2FeCl_3 + 2H_2O$
(2) $Cl_2 + H_2O_2 \rightarrow 2HCl + O_2$
(3) $2HI + H_2O_2 \rightarrow 2H_2O + I_2$
(4) $H_2SO_3 + H_2O_2 \rightarrow H_2SO_4 + H_2O$
RR0052

45. When H_2 reacts with Na, it acts as :-
(1) Oxidising agent
(2) Reducing agent
(3) Both
(4) Cannot be predicted
RR0054

46. In the course of a chemical reaction an oxidant –
(1) Loses electron
(2) Gains electron
(3) Both loses and gain electrons
(4) Electron change does not occur
RR0056

47. In the reaction:-
$C + 4HNO_3 \rightarrow CO_2 + 2H_2O + 4NO_2$
HNO_3 acts as :–
(1) An oxidising agent (2) An acid
(3) A reducing agent (4) A base
RR0057

48. A compound contains atoms A, B and C. The oxidation number of A is +2, of B is +5 and of C is –2. The possible formula of the compound is :
(1) ABC_2 (2) $B_2(AC_3)_2$
(3) $A_3(BC_4)_2$ (4) $A_3(B_4C)_2$
RR0058

49. Equivalent weight of N_2 in the change $N_2 \rightarrow NH_3$ is
(1) $\frac{28}{6}$ (2) 28 (3) $\frac{28}{2}$ (4) $\frac{28}{3}$
RR0059

50. Equivalent weight of NH_3 in the change $N_2 \rightarrow NH_3$ is :
(1) $\frac{17}{6}$ (2) 17 (3) $\frac{17}{2}$ (4) $\frac{17}{3}$
RR0060

51. In the reaction, $2S_2O_3^{2-} + I_2 \rightarrow S_4O_6^{2-} + 2I^-$, the eq. wt. of $Na_2S_2O_3$ is equal to its :
(1) Mol. wt. (2) Mol. wt./2
(3) 2 x Mol. wt. (4) Mol. wt./6
RR0061

52. In the reaction, $VO + Fe_2O_3 \rightarrow FeO + V_2O_5$, the eq. wt. of V_2O_5 is equal to its :
(1) Mol. wt. (2) Mol. wt./8
(3) Mol .wt./6 (4) Mol. wt./2
RR0062

53. Molecular weight of $KBrO_3$ is M. What is its equivalent weight, if the reaction is :
$BrO_3^- \rightarrow Br^-$ (acidic medium)
(1) M (2) M/4 (3) M/6 (4) 6M
RR0064

54. In the reaction : $A^{-n_2} + xe^- \rightarrow A^{-n_1}$, here x will be

(1) $n_1 + n_2$ (2) $n_2 - n_1$

(3) $n_1 - n_2$ (4) $-n_1 - n_2$

RR0065

55. What would be the equivalent weight of the reductant in the reaction :

$[Fe(CN)_6]^{-3} + H_2O_2 + 2OH^- \rightarrow 2[Fe(CN)_6]^{4-} + 2H_2O + O_2$

[Given : Fe = 56, C = 12, N = 14, O = 16, H = 1]

(1) 17 (2) 212 (3) 34 (4) 32

RR0066

56. Equivalent weight of FeC_2O_4 in the change : $FeC_2O_4 \rightarrow Fe^{3+} + CO_2$ is :

(1) M/3 (2) M/6

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

RR0068

57. The number of mole of oxalate ions oxidised by one mole of MnO_4^- is :

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

(3) 5/2 (4) 5

RR0070

58. In a reaction 4 mole of electrons are transferred to one mole of HNO_3 when it acts as an oxidant. The possible reduction product is :

(1) (1/2) mole N_2 (2) (1/2) mole N_2O

(3) 1 mole of NO_2 (4) 1 mole NH_3

RR0072

59. The equivalent weight of $MnSO_4$ is half of its molecular weight when it is converted to :-

(1) Mn_2O_3 (2) MnO_2

(3) MnO_4^- (4) MnO_4^{-2}

RR0073

60. In the following change, $3Fe+4H_2O \rightarrow Fe_3O_4+4H_2$ If the atomic weight of iron is 56, then its equivalent weight will be :-

(1) 42 (2) 21 (3) 63 (4) 84

RR0074

61. $Cr_2O_7^{-2} + I^- + H^+ \rightarrow Cr^{+3} + I_2 + H_2O$

The equivalent weight of the reductant in the above equation is :– (At. wt. of Cr=52, I=127)

(1) 26 (2) 127 (3) 63.5 (4) 10.4

RR0075

62. How many moles of $KMnO_4$ are reduced by 1 mole of ferrous oxalate in acidic medium:-

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

RR0076

REDOX REACTIONS

63. Which one of the following is a redox reaction ?

(1) $H_2 + Br_2 \rightarrow 2HBr$

(2) $2NaCl + H_2SO_4 \rightarrow Na_2SO_4 + 2HCl$

(3) $HCl + AgNO_3 \rightarrow AgCl + HNO_3$

(4) $NaOH + HCl \rightarrow NaCl + H_2O$

RR0078

64. Which of the following is not a redox change ?

(1) $2H_2S + SO_2 \rightarrow 2H_2O + 3S$

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

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

(4) $2KClO_3 \rightarrow 2KCl + 3O_2$

RR0079

65. In the reaction, $Cl_2 + OH^- \rightarrow Cl^- + ClO_4^- + H_2O$, chlorine is :

(1) Oxidised

(2) Reduced

(3) Oxidised as well as reduced

(4) Neither oxidised nor reduced

RR0081

66. Which is a redox reaction :

(1) $2CuI_2 \rightarrow CuI + I_2$

(2) $NaCl + AgNO_3 \rightarrow AgCl + NaNO_3$

(3) $NH_4Cl + NaOH \rightarrow NH_3 + NaCl + H_2O$

(4) $Cr_2(SO_4)_3 + 6KOH \rightarrow 2Cr(OH)_3 + 3K_2SO_4$

RR0082

67. Which of the following example does not represent disproportionation -

(1) $MnO_2 + 4HCl \rightarrow MnCl_2 + Cl_2 + 2H_2O$

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

(3) $4KClO_3 \rightarrow 3KClO_4 + KCl$

(4) $3Cl_2 + 6NaOH \rightarrow 5NaCl + NaClO_3 + 3H_2O$

RR0083

68. The decomposition of $KClO_3$ to KCl and O_2 on heating is an example of :
(1) Intermolecular redox change
(2) Intramolecular redox change
(3) Disproportionation or auto redox change
(4) Comproportionation

RR0084

69. Which of the following change represents a disproportionation reaction (s) :
(1) $Cl_2 + 2OH^- \rightarrow ClO^- + Cl^- + H_2O$
(2) $Cu_2O + 2H^+ \rightarrow Cu + Cu^{2+} + H_2O$
(3) $2HCuCl_2 \xrightarrow[\text{Water}]{\text{dilution with}} Cu + Cu^{2+} + 4Cl^- + 2H^+$
(4) All of the above

RR0085

70. How many electrons should X_2H_4 liberate so that in the new compound X shows oxidation number of -½ (E.N. X > H)
(1) 10 (2) 4 (3) 3 (4) 2

RR0087

71. Which one of the following is not a redox reaction :-
(1) $CaCO_3 \rightarrow CaO + CO_2$
(2) $2H_2 + O_2 \rightarrow 2H_2O$
(3) $Na + H_2O \rightarrow NaOH + \frac{1}{2}H_2$
(4) $MnCl_3 \rightarrow MnCl_2 + \frac{1}{2}Cl_2$

RR0088

72. In the reaction -
$MnO_4^- + SO_3^{2-} + H^+ \rightarrow SO_4^{-2} + Mn^{+2} + H_2O$
(1) MnO_4^- and H^+ both are reduced
(2) MnO_4^- is reduced and H^+ is oxidised
(3) MnO_4^- is reduced and SO_3^{2-} is oxidised
(4) MnO_4^- is oxidised and SO_3^{2-} is reduced

RR0089

73. $I_2 + KI \rightarrow KI_3$
In the above reaction:-
(1) Only oxidation taken place
(2) Only reduction takes place
(3) Both the above
(4) Neither oxidation nor reduction

RR0090

74. Which of the following reaction represents the oxidising behaviour of H_2SO_4 :-
(1) $2PCl_5 + H_2SO_4 \rightarrow 2POCl_3 + 2HCl + SO_2Cl_2$
(2) $2NaOH + H_2SO_4 \rightarrow Na_2SO_4 + 2H_2O$
(3) $NaCl + H_2SO_4 \rightarrow NaHSO_4 + HCl$
(4) $2HI + H_2SO_4 \rightarrow I_2 + SO_2 + 2H_2O$

RR0091

75. Select the example of disproportionation reaction
(1) $BaCl_2 + H_2SO_4 \rightarrow BaSO_4 + 2HCl$
(2) $NH_4NO_3 \rightarrow N_2O + 2H_2O$
(3) $4H_3PO_3 \rightarrow PH_3 + 3H_3PO_4$
(4) $AgCl + 2NH_3 \rightarrow Ag(NH_3)_2Cl$

RR0092

76. Which of the following reaction involves oxidation & reduction :-
(1) $NaBr + HCl \rightarrow NaCl + HBr$
(2) $HBr + AgNO_3 \rightarrow AgBr + HNO_3$
(3) $2NaOH + H_2SO_4 \rightarrow Na_2SO_4 + 2H_2O$
(4) $H_2 + Br_2 \rightarrow 2HBr$

RR0093

77. The reaction
$2K_2MnO_4 + Cl_2 \rightarrow 2KMnO_4 + 2KCl$ is an example of
(1) Redox
(2) Reduction only
(3) Neutralization
(4) Disproportionation

RR0094

78. Which of the following reaction involves neither oxidation nor reduction :–
(1) $CrO_4^{2-} \rightarrow Cr_2O_7^{2-}$ (2) $Cr \rightarrow CrCl_3$
(3) $Na \rightarrow Na^+$ (4) $2S_2O_3^{2-} \rightarrow S_4O_6^{2-}$

RR0095

79. $Zn + H_2SO_4 \rightarrow ZnSO_4 + H_2$
Zn undergoes –
(1) Reduction
(2) Oxidation
(3) Both oxidation and reduction
(4) Neither oxidation nor reduction

RR0096

BALANCING OF REDOX REACTIONS

80. Balance the following given half reaction for the unbalanced whole reaction :
$CrO_4^{2-} \rightarrow CrO_2^- + OH^-$ is :
(1) $CrO_4^{-2} + 2H_2O + 3e^- \rightarrow CrO_2^- + 4OH^-$
(2) $2CrO_4^{-2} + 8H_2O \rightarrow CrO_2^- + 4H_2O + 8OH^-$
(3) $CrO_4^{-2} + H_2O \rightarrow CrO_2^- + H_2O + OH^-$
(4) $3CrO_4^{-2} + 4H_2O + 6\,e^- \rightarrow 2CrO_2^{-1} + 8OH^-$

RR0097

81. Choose the set of coefficients that correctly balances the following equation :

$x\ Cr_2O_7^{2-} + yH^+ + z\ e^- \rightarrow a\ Cr^{+3} + bH_2O$

	x	y	z	a	b
(1)	2	14	6	2	7
(2)	1	14	6	2	7
(3)	2	7	6	2	7
(4)	2	7	6	1	7

RR0098

82. In the reaction:

$MnO_4^- + xH^+ + ne^- \rightarrow Mn^{2+} + yH_2O$

What is the value of n :

(1) 5 (2) 8 (3) 6 (4) 3

RR0099

83. The number of electrons required to balance charge in the following equation –

$MnO_4^- + 2H_2O \longrightarrow MnO_2 + 4OH^-$ is

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

RR0100

84. $2KMnO_4 + 5H_2S + 6H^+ \rightarrow 2Mn^{2+} + 2K^+ + 5S + 8H_2O$. In the above reaction, how many electrons would be involved in the oxidation of 1 mole of reductant?

(1) Two (2) Five (3) Ten (4) One

RR0102

85. The value of n in :

$MnO_4^- + 8\ H^+ + ne^- \rightarrow Mn^{2+} + 4\ H_2O$ is

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

RR0103

86. For the redox reaction

$Zn + NO_3^- \rightarrow Zn^{2+} + NH_4^+$ in basic medium, coefficients of Zn, NO_3^- and OH^- in the balanced equation respectively are :

(1) 4, 1, 7 (2) 7, 4, 1
(3) 4, 1, 10 (4) 1, 4, 10

RR0105

87. In the balanced equation-

$[Zn + H^+ + NO_3^- \rightarrow NH_4^+ + Zn^{+2} + H_2O]$

coefficient of NH_4^+ is:-

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

RR0106

88. In the balanced equation

$MnO_4^- + H^+ + C_2O_4^{2-} \rightarrow Mn^{2+} + CO_2 + H_2O$, the moles of CO_2 formed are :-

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

RR0107

89. In the following reaction the value of 'X' is

$H_2O + SO_3^{2-} \rightarrow SO_4^{2-} + 2H^+ + X$

(1) $4e^-$ (2) $3e^-$ (3) $2e^-$ (4) $1e^-$

RR0108

90. The number of electrons required to balance the following equation are:

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

(1) 2 on right side (2) 3 on left side
(3) 3 on right side (4) 5 on left side

RR0109

EXERCISE-I (Conceptual Questions) ANSWER KEY

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans.	**2**	**3**	**2**	**3**	**3**	**2**	**1**	**3**	**3**	**4**	**1**	**2**	**2**	**1**	**1**
Que.	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Ans.	**2**	**1**	**1**	**4**	**3**	**3**	**4**	**1**	**1**	**1**	**4**	**3**	**4**	**1**	**1**
Que.	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Ans.	**1**	**4**	**3**	**4**	**4**	**4**	**1**	**2**	**1**	**1**	**2**	**2**	**2**	**2**	**1**
Que.	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans.	**2**	**1**	**3**	**1**	**4**	**1**	**3**	**3**	**3**	**1**	**1**	**3**	**2**	**2**	**2**
Que.	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
Ans.	**2**	**4**	**1**	**3**	**3**	**1**	**1**	**2**	**4**	**3**	**1**	**3**	**3**	**4**	**3**
Que.	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
Ans.	**4**	**1**	**1**	**2**	**1**	**2**	**1**	**3**	**1**	**1**	**3**	**4**	**4**	**3**	**2**

EXERCISE-II (Previous Year Questions) AIPMT/NEET

AIPMT 2009

1. 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 :-

(1) –3, +6 and +6 (2) +5, +6 and +6
(3) +3, +6 and +5 (4) +5, +3 and +6

RR0111

AIPMT Pre. 2012

2. When Cl_2 gas reacts with hot and concentrated sodium hydroxide solution, the oxidation number of chlorine changes from:

(1) Zero to –1 and zero to +3
(2) Zero to +1 and zero to –3
(3) Zero to +1 and zero to –5
(4) Zero to –1 and zero to +5

RR0114

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

(1) N_3H (2) NH_2OH
(3) N_2H_4 (4) NH_3

RR0115

AIPMT 2014

4. The reaction of aqueous $KMnO_4$ with H_2O_2 in acidic conditions gives :-

(1) Mn^{4+} and O_2 (2) Mn^{2+} and O_2
(3) Mn^{2+} and O_3 (4) Mn^{4+} and MnO_2

RR0119

RE-AIPMT 2015

5. Assuming complete ionization, same moles of which of the following compounds will require the least amount of acidified $KMnO_4$ for complete oxidation?

(1) FeC_2O_4 (2) $Fe(NO_2)_2$
(3) $FeSO_4$ (4) $FeSO_3$

RR0121

NEET-II 2016

6. Hot concentrated sulphuric acid is a moderately strong oxidizing agent. Which of the following reactions does not show oxidizing behaviour ?

(1) $C + 2H_2SO_4 \rightarrow CO_2 + 2SO_2 + 2H_2O$
(2) $CaF_2 + H_2SO_4 \rightarrow CaSO_4 + 2HF$
(3) $Cu + 2H_2SO_4 \rightarrow CuSO_4 + SO_2 + 2H_2O$
(4) $3S + 2H_2SO_4 \rightarrow 3SO_2 + 2H_2O$

RR0124

NEET(UG) 2018

7. For the redox reaction

$MnO_4^- + C_2O_4^{2-} + H^+ \longrightarrow Mn^{2+} + CO_2 + H_2O$

the correct coefficients of the reactants for the balanced equation are

	MnO_4^-	$C_2O_4^{2-}$	H^+
(1)	16	5	2
(2)	2	5	16
(3)	2	16	5
(4)	5	16	2

RR0125

NEET(UG) 2019

8. Which of the following reactions are disproportionation reaction ?

(a) $2Cu^+ \rightarrow Cu^{2+} + Cu^0$
(b) $3MnO_4^{2-} + 4H^+ \rightarrow 2MnO_4^- + MnO_2 + 2H_2O$
(c) $2KMnO_4 \xrightarrow{\Delta} K_2MnO_4 + MnO_2 + O_2$
(d) $2MnO_4^- + 3Mn^{2+} + 2H_2O \rightarrow 5MnO_2 + 4H^{\oplus}$

Select the **correct** option from the following :-

(1) (a) and (b) only (2) (a), (b) and (c)
(3) (a), (c) and (d) (4) (a) and (d) only

RR0167

NEET (UG) 2020

9. What is the change in oxidation number of carbon in the following reaction ?

$CH_4(g) + 4Cl_2(g) \rightarrow CCl_4(l) + 4HCl(g)$

(1) 0 to –4 (2) +4 to +4
(3) 0 to +4 (4) –4 to +4

RR0186

NEET(UG) 2021 (Paper-2)

10. The equivalent weight of the salt

$KHC_2O_4.H_2C_2O_4.4H_2O$

used as reducing agent is

(1) $\frac{\text{Mol. wt}}{1}$ (2) $\frac{\text{Mol. wt}}{2}$
(3) $\frac{\text{Mol. wt}}{3}$ (4) $\frac{\text{Mol. wt}}{4}$

RR0188

NEET (UG) 2022

11. In the neutral or faintly alkaline medium, $KMnO_4$ oxidses iodide into iodate. The change in oxidation state of manganese in this reaction is from

(1) +6 to +4 (2) +7 to +3
(3) +6 to +5 (4) +7 to +4

RR0189

NEET (UG) 2022 (OVERSEAS)

12. Identify the set from the following sets in which all species can exhibit disproportionation reactions.

(1) $Cl_2, ClO_2^-, ClO_3^-, S_8$

(2) $ClO_4^-, ClO^-, ClO_2^-, F_2$

(3) $ClO_3^-, ClO_4^-, H_2O_2, ClO^-$

(4) $ClO_2^-, ClO_3^-, ClO_4^-, Cl_2$

RR0190

Re-NEET (UG) 2022

13. Which of the following reactions is a decomposition redox reaction ?

(1) $2\ Pb(NO_3)_2(s) \rightarrow 2\ PbO(s) + 4\ NO_2(g) + O_2(g)$

(2) $N_2(g) + O_2(g) \rightarrow 2\ NO(g)$

(3) $Cl_2(g) + 2OH^-(aq) \rightarrow ClO^-(aq) + Cl^-(aq) + 4H_2O(\ell)$

(4) $P_4(s) + 3OH^-(aq) + 3H_2O(\ell) \rightarrow PH_3(g) + 3H_2PO_2^-(aq)$

RR0191

EXERCISE-II (Previous Year Questions) ANSWER KEY

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13
Ans.	**2**	**4**	**1**	**2**	**3**	**2**	**2**	**1**	**4**	**4**	**4**	**1**	**1**

EXERCISE-III (Analytical Questions) Master Your Understanding

1. In the reaction $CH_3OH \rightarrow HCOOH$, the number of electrons that must be added to the right is :-
(1) 4 (2) 3 (3) 2 (4) 1
RR0127

2. 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 $-\frac{1}{2}$ in superoxides
(4) Oxidation number of oxygen is –2 in most of its compound
RR0128

3. In the reaction $8Al + 3Fe_3O_4 \rightarrow 4Al_2O_3 + 9Fe$, the number of electrons transferred from reductant to oxidant is :-
(1) 8 (2) 4 (3) 16 (4) 24
RR0129

4. In which of the following reaction hydrogen is acting as an oxidising agent :-
(1) With iodine to give hydrogen iodide
(2) With lithium to give lithium hydride
(3) With nitrogen to give ammonia
(4) With sulphur to give hydrogen sulphide
RR0130

5. Oxidation number of Xe in XeF_5^- is :
(1) +1 (2) +2 (3) +3 (4) +4
RR0131

6. Which is the best description of the behaviour of bromine in the reaction given below :-
$H_2O + Br_2 \rightarrow HOBr + HBr$
(1) Both oxidized and reduced
(2) Oxidized only
(3) Reduced only
(4) Proton acceptor only
RR0132

7. The correct order of acidic strength is –
(1) $HClO_4 < HClO_3 < HClO_2 < HClO$
(2) $HClO_2 < HClO_3 < HClO_4 < HClO$
(3) $HClO_4 < HClO < HClO_2 < HClO_3$
(4) $HClO < HClO_2 < HClO_3 < HClO_4$
RR0133

8. Consider the following reaction:

$$xMnO_4^- + yC_2O_4^{2-} + zH^+ \rightarrow xMn^{2+} + 2yCO_2 + \frac{z}{2} + H_2O$$

The values of x, y and z in the reaction are respectively:-
(1) 5,2 and 16 (2) 2,5 and 8
(3) 2, 5 and 16 (4) 5,2 and 8
RR0134

9. In which of the following reaction H_2O_2 acts as a reducing agent ?
(a) $H_2O_2 + 2H^+ + 2e^- \rightarrow 2H_2O$
(b) $H_2O_2 - 2e^- \rightarrow O_2 + 2H^+$
(c) $H_2O_2 + 2e^- \rightarrow 2OH^-$
(d) $H_2O_2 + 2OH^- - 2e^- \rightarrow O_2 + 2H_2O$
(1) (a), (c) (2) (b), (d) (3) (a), (b) (4) (c), (d)
RR0135

10. In the following reaction
$2FeCl_3 + H_2S \longrightarrow 2FeCl_2 + 2HCl + S$
(1) $FeCl_3$ is oxidant
(2) $FeCl_3$ & H_2S are oxidised
(3) $FeCl_3$ is oxidised & H_2S is reduced
(4) H_2S is oxidant
RR0137

11. In oxidation reduction reaction
$Cr_2O_7^{-2} + SO_3^{-2} + H^+ \rightarrow Cr^{+3} + SO_4^{-2} + H_2O$ the balance equation coefficient for $Cr_2O_7^{-2}$, SO_3^{-2}, H^+ are :–
(1) 1, 3, 8 (2) 16, 5, 2
(3) 2, 16, 5 (4) 5, 2, 16
RR0138

12. Which of the following act both as oxidant & reductant:–

(1) H_2S (2) SO_3

(3) H_2O_2 (4) F_2

RR0139

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

(1) +1 (2) +3

(3) +5 (4) +7

RR0141

14. Identify the reducing agent in the reaction.

$3Fe_3O_4 + 8Al\ (s) \rightarrow 9Fe + 4Al_2O_3\ (s)$

(1) Fe_3O_4 (2) Al

(3) Fe (4) Al_2O_3

RR0168

15. Which of the following is a disproportionation reaction:

(1) $2KClO_3 \longrightarrow 2KCl + 3O_2$

(2) $CaCO_3 \longrightarrow CaO + CO_2$

(3) $2H_2O_2 \longrightarrow 2H_2O + O_2$

(4) $Fe^{+2} + MnO_4^- + 8H^+ \longrightarrow Fe^{+3} + Mn^{+2} + 4H_2O$

RR0169

EXERCISE-III (Analytical Questions) ANSWER KEY

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans.	**1**	**1**	**4**	**2**	**4**	**1**	**4**	**3**	**2**	**1**	**1**	**3**	**4**	**2**	**3**