CHEMISTRY

BOOKS - A2Z CHEMISTRY (HINGLISH)

REDOX REACTIONS

Oxidation Number Oxidising And Reducing Agent

1. Oxidation can be defined as the terms

(I) gain of electron and hydrogen

(II) gain of oxygen and loss of electron

(III) increase in oxidation number

(IV) decrease in oxidation number

Select the correct terms

A. I and II

B. I and IV

C. I and III

D. II and III

Answer: D

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2. The oxidation number of S in $H_2S_2O_8$ is

A. $+2$

B. $+4$

C. $+6$

D. $+7$

Answer: C

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3. In the reaction

$H_2S + NO_2 \rightarrow H_2O + NO + S$. H_2S is

A. Oxidised

B. Reduced

C. Precipitated

D. None of these

Answer: A

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4. In which of the following processes is nitrogen oxidised ?

A. $NH_4^+ \rightarrow N_2$

B. $NO_3^- \rightarrow NO$

C. $NO_2 \rightarrow NO_2^-$

D. $NO_3 \rightarrow NH_4^+$

Answer: A

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5. Reduction is defined in terms of

(I) electronation and hydrogenation

(II) de-electronation and gain of oxygen

(III) increase in oxidation number

(IV) decrease in oxidation number

Select the correct terms

A. II and III

B. I and III

C. I and IV

D. I and II

Answer: C

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6. Which of the following statements is correct?

A. Hydrogen has oxidation number -1 and $+1$

B. Hydrogen has same electronegativity as halogens

C. Hydrogen will not be liberated at anode

D. Hydrogen has same ionization potential as alkali metals

Answer: A

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7. The conversion of PbO_2 to $Pb(NO_3)_2$ is

A. Oxidation

B. Reduction

C. Neither oxidation nor reduction

D. Both oxidation and reaction

Answer: B

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8. The oxidation number of I in HIO_4 is

A. $+7$

B. $+6$

C. $+3$

D. $+14$

Answer: A

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9. Which of the following reactions does not involve either oxidation or reduction ?

A. $VO_2^+ \rightarrow V_2O_3$

B. $Na \rightarrow Na^+$

C. $CrO_4^{2-} \rightarrow Cr_2O_7^{2-}$

D. $Zn^{2+} \rightarrow Zn$

Answer: C

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10. Which one of the following has the highest oxidation number of iodine?

A. K_3I

B. KI

C. IF_5

D. KIO_4

Answer: D

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11. In the reaction

$$3Br_2 + 6CO_3^{2-} + 3H_2O \rightarrow 5Br^{\ominus} + BrO_3^{\ominus} + 6HCO_3^{\ominus}$$

A. Bromine is oxidised and carbonate is reduced

B. Bromine is reduced and water is oxidised

C. Bromine is neither reduced nor oxidised

D. Bromine is both reduced and oxidised

Answer: D

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12. In the following reaction,

$$4P + 3KOH + 3H_2O \rightarrow 3KH_2PO_2 + PH_3$$

A. P is oxidised as well as reduced

B. P is reduced only

C. P is oxidised only

D. None of these

Answer: A

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13. In the reaction:

$$Cr_2O_7^{2-} + 14H^{\oplus} + 6I^{\ominus} \rightarrow 2Cr^{3+} + 3H_2O + 3I_2$$

Which element is reduced?

A. Cr

B. H

C. O

D. I

Answer: A

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14. If HNO_3 changes into N_2O, the oxidation number is changed by

A. $+2$

B. -1

C. 0

D. $+4$

Answer: D

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15. Oxidation number of sulphur in H_2SO_5 is

A. $+2$

B. $+4$

C. $+8$

D. $+6$

Answer: D

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16. In which of the following cases is the oxidation state of N atom wrongly calculated?

A. (Compound $= NH_4Cl$, Oxidation state $= -3$)

B. (Compound $= (N_2H_5)_2SO_4$, Oxidation state $= +2$)

C. (Compound $= Mg_3N_2$, Oxidation state $= -3$)

D. (Compound $= NH_2OH$, Oxidation state $= -1$)

Answer: B

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17. In which one of the following changes there are transfer of five electrons?

A. $MnO_4^- \rightarrow Mn^{2+}$

B. $CrO_4^{2} \rightarrow Cr^{3+}$

C. $MnO_4^{2-} \rightarrow Mn^{2+}$

D. $Cr_2O_7^{2-} \rightarrow 2Cr^{3+}$

Answer: A

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18. Oxidation involves

A. Decreases in the valency of positive part

B. Gain of electrons

C. Increase in the valency of negative part

D. Loss of electrons

Answer: D

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19. Equation $H_2S + H_2O_2 \rightarrow S + 2H_2O$ represents

A. Acidic nature of H_2O_2

B. Basic nature of H_2O_2

C. Oxidising nature of H_2O_2

D. Reducing nature of H_2O_2

Answer: C

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20. In the reaction

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

the reductant is

A. $C_2O_4^{2-}$

B. MnO_4^-

C. Mn^{2+}

D. H^{+}

Answer: A

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21. 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. Fe_2O

Answer: C

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22. When Sn^{2+} changes to Sn^{4+} in a reaction

A. It loses two protons

B. It gains two electrons

C. It loses two electrons

D. It gains two protons

Answer: C

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23. Which of the following is the most powerful oxidizing agent?

A. F_2

B. Cl_2

C. Br_2

D. l_2

Answer: A

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24. In the chemical reaction $Cl_2 + H_2S \rightarrow 2HCl + S$, the oxidation number of sulphur changes from

A. 0 to 2

B. -2 to 0

C. 2 to0

D. -2 to -1

Answer: B

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25. When SO_2 is passed through acidic solution of potassium dichromate, then chromium sulphate is formed. Change in valency of chronium is

A. $+4$ to $+2$

B. $+5$ to $+3$

C. $+6$ to $+3$

D. $+7$ to $+2$

Answer: C

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26. The oxidation states of the most electronegative elements in the products of the reaction between BaO_2 and H_2SO_4 are

A. 0 and -1

B. -1 and -2

C. -2 and 0

D. -2 and $+1$

Answer: B

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27. The highest oxidation state of Mn is shown by

A. K_2MnO_4

B. $KMnO_4$

C. MnO_2

D. Mn_2O_2

Answer: B

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28. The oxidation number of C in CH_2O is

A. -2

B. $+2$

C. 0

D. $+4$

Answer: C

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29. Oxidation number of N in $(NH_4)_2SO_4$ is

A. -3

B. -1

C. $+1$

D. $-1/3$

Answer: A

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30. In which of the following compounds transition metal is in oxidation state zero

A. $\left[Co(NH_3)_6\right]Cl_2$

B. $\left[Fe(H_2O)_6SO_4\right]$

C. $\left[Ni(CO)_4\right]$

D. $\left[Fe(H_2O)_3\right](OH)_2$

Answer: C

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31. Oxidation number of nickel in $Ni(CI)_4$

A. $+2$

B. $+4$

C. -4

D. 0

Answer: D

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32. Which of the following is not a reducing agent?

A. $NaNO_2$

B. $NaNO_3$

C. HI

D. $SnCl_2$

Answer: B

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33. The brown ring complex compound is formulated as $\left[Fe(H_2O)_5NO\right]SO_4$. The oxidation state of Fe is

A. 1

B. 2

C. 3

D. 0

Answer: B

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34. The oxidation number of Mn in MnO_4^{-1} is

A. $+6$

B. -5

C. $+7$

D. $+5$

Answer: C

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35. In $C + H_2O \rightarrow CO + H_2$, H_2O acts as

A. Oxidising agent

B. Reducing agent

C. (a) and (b) both

D. None of these

Answer: A

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36. The oxidation numbers of Fe and S in iron pyrites are

A. $3, -1$

B. $2, -1$

C. $3, -1.5$

D. $4, -2$

Answer: D

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37. In which of the following cpmpounds the oxidation number of carbon is maximum

A. $HCHO$

B. CH_3OH

C. $CHCl_3$

D. $C_{12}H_{22}O_{11}$

Answer: C

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38. Sulphur has lowest oxidation number in

A. H_2SO_3

B. SO_2

C. H_2SO_4

D. H_2S

Answer: D

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39. A solution of sulphur dioxide in water reacts with H_2S precipitating sulphur. Here sulphur dioxide acts as

A. As oxidising agent

B. A reducing agent

C. An acid

D. A catayst

Answer: A

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40. In ferrous ammonium sulhate oxidation number of Fe is

A. $+3$

B. $+2$

C. $+1$

D. -2

Answer: B

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41. The oxidation number of Cr in $K_2Cr_2O_7$ is

A. -2

B. -7

C. $+2$

D. $+6$

Answer: D

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42. Oxidation number of carbon in $CH_3 - Cl$ is

A. -3

B. -2

C. -1

D. 0

Answer: B

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43. In which of the following reactions H_2O_2 is a reducing agent?

A. $2FeCl_2 + 2HCl + H_2O_2 \rightarrow 2FeCl_3 + 2H_2O$

B. $Cl_2 + H_2O_2 \rightarrow 2HCl + O_2$

C. $2HI + H_2O_2 \rightarrow 2H_2O + I_2$

D. $H_2SO_3 + H_2O_2 \rightarrow H_2SO_4 + H_2O$

Answer: B

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44. Oxidation numbers of two Cl atoms in belaching powder, $CaOCl_2$, are

A. $-1, -1$

B. $+1, -1$

C. $+1, +1$

D. $0, -1$

Answer: B

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45. Select the compound in which chlorine is assigned the oxidation number $+5$

A. $HClO_4$

B. $HClO_2$

C. $HClO_3$

D. HCl

Answer: C

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46. When $NaCl$ is dissolved in water the sodium ion becomes

A. Oxidised

B. Reduced

C. Hydrolysed

D. Hydrated

Answer: D

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47. Oxidation number of osmium (Os) in OsO_4 is

A. $+8$

B. $+6$

C. $+7$

D. $+4$

Answer: A

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48. The oxidation number of iron in the compound $K_4\left[Fe(CN)_6\right]$ is

A. $+2$

B. $+4$

C. $+3$

D. $+6$

Answer: A

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49. Which substance is serving as a reducing agent in the following reaction?

$14H^+ + Cr_2O_7^{2-} + 3Ni \rightarrow 2Cr^{3+} + 7H_2O + 3Ni^{2+}$

A. H_2O

B. Ni

C. H^+

D. $Cr_2O_7^{2-}$

Answer: B

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50. When $KMnO_4$ acts as an oxidising agnet and ultimetely from MnO_4^{2-}, MnO_2, Mn_2O_3, and Mn^{2+}, then the number of electrons transferred in each case, respectively, are

A. 4,3,1,5

B. 1,5,3,7

C. 1,3,4,5

D. 3,5,7,1

Answer: C

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51. Which of the following acids possesses oxidising, reducing, and complex forming properties ?

A. HNO_3

B. H_2SO_4

C. HCl

D. HNO_2

Answer: A

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52. Oxidation number of P in KH_2PO_2 is

A. -4

B. $+3$

C. $+5$

D. $+1$

Answer: D

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53. Which one is oxidising substance?

A. $C_2H_2O_2$

B. CO

C. H_2S

D. CO_2

Answer: D

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54. The compound that can work both as oxidising and reducing agent is

A. $KMnO_4$

B. H_2O_2

C. BaO_2

D. $K_2Cr_2O_7$

Answer: B

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55. Oxidation number of P in $Ba(H_2PO_2)_2$ is

A. $+1$

B. -1

C. $+2$

D. $+3$

Answer: A

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56. The oxidation number and the electronic configuration of sulphur in H_2SO_4 is

A. $+6, 1s^2 2s^2 2p^6$

B. $+2, 1s^2 2s^2 2p^6 3s^2 3p^2$

C. $+3, 1s^2 2s^2 2p^6 3s^2 3p^1$

D. $+4, 1s^2 2s^2 2p^6 3s^2$

Answer: A

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57. The compound which could not act both as oxidising and reducing agent is

A. SO_2

B. MnO_2

C. Al_2O_3

D. CrO

Answer: C

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58. In XeO_3 and XeF_6 the oxidation state of Xe is

A. $+4$

B. $+1$

C. $+6$

D. $+3$

Answer: C

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59. In the reaction

$Ag_2O + H_2O_2 \rightarrow 2Ag + H_2O + O_2$,$H_2O_2$ acts as

A. Reducing agent

B. Oxidising agent

C. Bleaching agent

D. None of the above

Answer: A

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60. The oxidation state of Cr in $Cr_2O_7^{2-}$ is

A. 4

B. 6

C. -6

D. -2

Answer: B

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61. A metal ion M^{3+} loses three electrons , its oxidation number will be

A. 0

B. $+3$

C. $+6$

D. -3

Answer: C

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62. Oxidation number of sulphur in $S_2SO_3^{2-}$ is

A. -2

B. $+6$

C. $+2$

D. 0

Answer: C

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63. Which of the following substances acts as an oxidising as well as a reducing agent?

A. Na_2O

B. $SnCl_2$

C. Na_2O_2

D. $NaNO_2$

Answer: D

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64. Oxidation state of oxygen atom in potassium superoxide is

A. 0

B. $-\frac{1}{2}$

C. -1

D. -2

Answer: B

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65. Among 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

Answer: D

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66. The oxidation number of S in $Na_2S_4O_6$ is

A. $\frac{5}{2}$

B. $\frac{3}{2}$

C. $\frac{3}{5}$

D. $\frac{2}{3}$

Answer: A

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67. HNO_2 acts both as reductant and as oxidant, while HNO_3 acts only as oxidant. It is due to their

A. Solubility ability

B. Maximum oxidation number

C. Minimum oxidation number

D. Minimum number of valence electrons

Answer: B

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68. In which reaction there is a change in valency

A. $2NO_2 \rightarrow N_2O_4$

B. $NH_4OH \rightarrow NH_4^+ + OH^-$

C. $2NO_2 + H_2O \rightarrow HNO_2 + HNO_3$

D. $CaCO_3 \rightarrow CaO + CO(2)$

Answer: C

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69. Which one of the following reaction is not an example of redox reaction?

A. $Cl_2 + 2H_2O + SO_2 \rightarrow 4H^+ + SO_4^{2-} + 2Cl^-$

B. $Cu^{++} + Zn \rightarrow Zn^{++} + Cu$

C. $2H_2 + O_2 \rightarrow 2H_2O$

D. $HCl + H_2O \rightarrow H_3O^- + Cl^-$

Answer: D

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70. Oxidation numbers of Mn in K_2MnO_4 and $MnSO_4$ are respectively

A. $+7,+2$

B. $+5,+2$

C. $+6,+2$

D. $+2,+6$

Answer: C

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71. What is the oxidation number of Co in $\left[Co(NH_3)_4ClNO_2\right]$?

A. $+5$

B. $+3$

C. $+4$

D. $+2$

Answer: D

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72. The valency of Cr in the complex $\left[Cr(H_2O)_4Cl_2\right]^+$

A. 1

B. 3

C. 5

D. 6

Answer: B

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73. Oxidation number of N in NH_3 is

A. $+5$

B. $+3$

C. 0

D. -3

Answer: D

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74. Oxidation number of nitrogen in $NaNO_2$ is

A. $+2$

B. $+4$

C. $+3$

D. -3

Answer: C

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75. which of the following is a redox reaction ?

A. $Zn + 2AgCN \rightarrow 2Ag + Zn(CN)_2$

B. $Mg(OH)_2 + 2NH_4Cl \rightarrow MgCl_2 + 2NH_4OH$

C. $CaC_2O_4 + 2HCl \rightarrow CaCl_2 + H_2C_2O_4$

D. $NaCl + KNO_3 \rightarrow NaNO_3 + KCl$

Answer: A

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76. When $K_2Cr_2O_7$ is converted to K_2CrO_4, the change in the oxidation state of chromium is

A. 0

B. 6

C. 4

D. 3

Answer: A

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77. Which of the following reactions involves oxidation-reaction?

A. $H_2 + Br_2 \rightarrow 2HBr$

B. $HBr + AgNO_3 \rightarrow AgBr + HNO_3$

C. $NaBr + HCl \rightarrow NaCl + HBr$

D. $2NaOH + H_2SO_4 \rightarrow NaSO_4 + 2H_2O$

Answer: A

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78. The oxidation number of sulphur in $H_2S_2O_7$ and iron in $K_4Fe(CN)_6$ is respectively

A. $+6$ and $+4$

B. $+2$ and $+2$

C. $+8$ and $+2$

D. $+6$ and $+2$

Answer: D

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79. Oxidation state of chlorine in perchloric acid is

A. -1

B. 0

C. -7

D. $+7$

Answer: D

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80. Carbon is in the lowest oxidation state in

A. CH_4

B. CCl_4

C. CF_4

D. CO_2

Answer: A

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81. Oxidation number of carbon in $H_2C_2O_4$ is

A. $+4$

B. $+3$

C. $+2$

D. -2

Answer: B

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82. Which of the following can act as an acid as a base?

A. $HClO_3^-$

B. $H_2PO_4^-$

C. HS^-

D. All of these

Answer: D

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Balancing Of The Equation

1. H_2O_2 reduces MnO_4^- ion to

A. Mn^+

B. Mn^{2+}

C. Mn^{3+}

D. Mn^-

Answer: B

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2. The value of x in the partial redox equation

$MnO_4^- + 8H^+ + xe \Leftrightarrow Mn^{2+} + 4H_2O$ is

A. 5

B. 3

C. 1

D. 0

Answer: A

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3. During the disproportionation of I_2 to iodide and iodate ions, the ratio of iodate and iodide ions formed in alkaline medium is

A. $1:5$

B. $5:1$

C. $3:1$

D. $1:3$

Answer: A

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4. What is $'A'$ in the following reaction $2F^{3+}_{(aq)} + Sn^{2+}_{(aq)} \rightarrow 2Fe^{2+}_{(aq)} + A$?

A. $Sn^{3+}_{(aq)}$

B. $Sn^{2+}_{(aq)}$

C. $Sn^{4+}_{(aq)}$

D. Sn

Answer: C

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5. In the redox reaction

$$xMnO + yPbO_2 + zHNO_3 \rightarrow HMnO_4 + Pb(NO_3)_2 + H_2O$$

A. $x = 2, y = 5, z = 10$

B. $x = 2, y = 7, z = 8$

C. $x = 2, y = 5, z = 8$

D. $x = 2, y = 5, z = 5$

Answer: A

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6. In the balanced chemical reaction

$$IO_3^{\ominus} + al^{\ominus} + bH^{\ominus} \rightarrow cH_2O + dI_2$$

a, b, c, and d, respectively, correspond to

A. 5,6,5,5

B. 5,3,6,3

C. 3,5,3,6

D. 5,6,3,3

Answer: D

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7. For the redox reaction

$$MnO_4^{\ominus} + C_2O_4^{2-} + H^{\oplus} \rightarrow Mn^{2+} + CO_2 + H_2O$$

the correct coefficients of the reactions for the balanced reaction are

A. $(MnO_4^- = 2, C_2O_4^{2-} = 5, H^+ = 16)$

B. $(MnO_4^- = 16, C_2O_4^{2-} = 5, H^+ = 2)$

C. $(MnO_4^- = 5, C_2O_4^{2-} = 16, H^+ = 2)$

D. $(MnO_4^- = 2, C_2O_4^{2-} = 16, H^+ = 5)$

Answer: A

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8. For the redox reaction

$$xFe^{2+} + yCr_2O_7^{2-} + zH^+ \rightarrow Fe^{3+} + Cr^{3+} + H_2O$$

x, y and z are

A. $(x = 3, y = 1, z = 14)$

B. $(x = 6, y = 1, z = 7)$

C. $(x = 6, y = 2, z = 14)$

D. $(x = 6, y = 1, z = 14)$

Answer: D

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9. $C_2H_6(g) + nO_2 \rightarrow CO_2(g) + H_2O(l)$

In this equation, the ratio of the coefficients of CO_2 and H_2O is

A. $1:1$

B. $2:3$

C. $3:2$

D. $1:3$

Answer: B

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10. Number of electron involved in the reduction of $Cr_2O_7^{2-}$ ion in acidic solution to Cr^{3+} is:

A. 0

B. 2

C. 3

D. 5

Answer: C

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11. $2MnO_4^- + 5H_2O_2 + 6H^- \rightarrow 2Z + 5O_2 + 8H_2O.$ In this reaction Z is

A. Mn^{+2}

B. Mn^{+4}

C. MnO_2

D. Mn

Answer: A

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12. H_2O can be oxidised to

A. H_2 and O_2

B. O_2

C. OH^-

D. O^{2-}

Answer: B

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13. When ZnS is boiled with strong nitric acid, the products are zinc nitrate, sulphuric acid and nitrogen dioxide. What are the changes in the oxidation numbers of Zn, S and N?

A. $+2, +4, -1$

B. $+2, +6, -2$

C. $0, +4, -2$

D. $0, +8, -1$

Answer: D

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14. Which of the following equations is a balanced one?

A. $5BiO_3^- + 22H^+ + Mn^{2+} \rightarrow 5Bi^{3+} + 7H_2O + MnO_4^-$

B. $5BiO_3^- + 14H^+ + 2Mn^{2+} \rightarrow 5Bi^{3+} + 7H_2O + 2MnO_4^-$

C. $2BiO_3^- + 4H^+ + Mn^{2+} \rightarrow 2Bi^{3+} + 2H_2O + MnO_4^-$

D. $6BiO_3^- + 12H^+ + 3Mn^{2+} \rightarrow 6Bi^{3+} + 6H_2O + 3MnO_4^-$

Answer: B

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15. In the following reaction

$2I- + Cr_2O_7^{2-} + 14H^+ \rightarrow I_2 + 2Cl^3 + 7H_2O$

Unbalanced parts are

A. H^+, H_2O

B. $Cr_2O_7^{2-}, Cr^{3+}$

C. I^-, I_2

D. None of them are balanced

Answer: C

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16. For the redox reaction

$$Cr_2O_7^{-2} + H^+ + Ni \rightarrow Cr^3 + Ni^{2+} + H_2O$$

The correct coefficients of the reactions for the balanced reaction are

A. $(Cr_2O_7^{2-} = 1, Ni = 3, H^+ = 14)$

B. $(Cr_2O_7^{2-} = 2, Ni = 3, H^+ = 14)$

C. $(Cr_2O_7^{2-} = 1, Ni = 1, H^+ = 16)$

D. $(Cr_2O_7^{2-} = 3, Ni = 3, H^+ = 12)$

Answer: A

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17. MnO_4^- oxidises H_2O_2 to O_2 in acidic medium

$xMnO_4^- + yH_2O_2 + zH^+ \rightarrow Mn^{2+} + O_2 + H_2O$

Coefficients x, y and z are respectively

A. $(x = 1, y = 2, z = 3)$

B. $(x = 3, y = 2, z = 5)$

C. $(x = 2, y = 6, z = 5)$

D. $(x = 2, y = 5, z = 6)$

Answer: D

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18. What is the molecular state of sulphur as reactant in, sulphur $+12OH^- \rightarrow 4S^{2-} + 2S_2O_3^{2-} + 3H_2O$?

A. S_8^{2-}

B. $2S_4^{3-}$

C. S_8

D. S_8^-

Answer: C

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19. In the following balanced reaction,

$4O_2^x + 2H_2O \rightarrow 4OH^- + 3O_2$

A. $x = -4$ and species is oxide

B. $x = -2$ and species is superoxide

C. $x = 0$ and species is oxygen

D. $x = -1$ and species is superoxide

Answer: D

Watch Video Solution

20. In balancing the half reaction

$CN^{\ominus} \rightarrow CNO^{\ominus}$ (skeltan)

The number of electrons that must be added is

A. 0

B. 1 on the right

C. 1 on the left

D. 2 on the right

Answer: D

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21. In the following equation:

$ClO_3^- + 6H^+ + . X \rightarrow Cl^- + 3H_2O$, then X is

A. O

B. $6e^-$

C. O_2

D. $6e^-$

Answer: B

Watch Video Solution

22. I^- reduces IO_3^- and I_2 and itself oxidised to I_2 in acidic medium.

Thus, final reaction is

A. $I^- + IO_3^- + 6H^+ \rightarrow I_2 + 3H_2O$

B. $5I^- + IO_3^- + 6H^+ \rightarrow 3I_2 + 3H_2O$

C. $I^- + IO_3^- \rightarrow I_2 + O_3$

D. None of them

Answer: B

Watch Video Solution

23. In the reaction

$xHI + yHNO_3 \rightarrow NO + I_2 + H_2O$

A. $x = 3, y = 2$

B. $x = 2, y = 3$

C. $x = 6, y = 2$

D. $x = 6, y = 1$

Answer: C

Watch Video Solution

24. Balance the following equation stepwise:

$$Cr_2O_7^{2-} + Fe^{2+} + + H^{\oplus} \rightarrow Cr^{3+} + Fe^{3+} + H_2O$$

A. 6, 7

B. 6, 14

C. 5, 7

D. 5, 14

Answer: B

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25. Values of p, q, r, s and t are in the following redox reaction

$$pBr_2 + qOH^- \rightarrow rBr^- + sBrO_3^- + tH_2O$$

A. $(p = 3, q = 6, r = 1, s = 5, t = 3)$

B. $(p = 3, q = 6, r = 5, s = 3, t = 1)$

C. $(p = 3, q = 6, r = 5, s = 1, t = 3)$

D. $(p = 3, q = 5, r = 1, s = 6, t = 3)$

Answer: C

Watch Video Solution

26. In the following reaction:

$$xKMnO_4 + yNH_3 \rightarrow KNO_3 + MnO_2 + KOH + H_2O$$

x and y are

A. $x = 4, y = 6$

B. $x = 8, y = 3$

C. $x = 8, y = 6$

D. $x = 3, y = 8$

Answer: B

Watch Video Solution

27. CuS is dissolved in dil. HNO_3. Balanced equation with correct products is

A. $Cus + 2H^+ + 3NO_3^- \rightarrow Cu(NO_3)_2 + H_2S + H_2O + NO_2$

B.

$$3Cus + 8H^+ + 8NO_3^- \rightarrow 3Cu(NO_3)_2 + 3S + 4H_2O + 2NO$$

C. $Cus + 4NO_3^- \rightarrow Cu(NO_3)_2 + H_2S + H_2O$

D. None of the above in correct

Answer: B

Watch Video Solution

28. The reaction

$$5H_2O_2 + XClO_2 + 2OH^- \rightarrow XCl^- + YO_2 + 6H_2O$$

is balanced if

A. $x = 5, y = 2$

B. $x = 2, y = 5$

C. $x = 4, y = 10$

D. $x = 5, y = 5$

Answer: B

Watch Video Solution

Stoichiometry In Redox Reactions

1. When $KMnO_4$ is reduced with oxalic acid in acidic solution, the oxidation number of Mn changes from

A. 7 to 4

B. 7 to 2

C. 6 to 4

D. 4 to 2

Answer: B

Watch Video Solution

2. Oxidation of thisulphate $\left(S_2O_3^{2-}\right)$ ion by iodine gives

A. SO_2^{3-}

B. SO_4^{2-}

C. $S_4O_6^{2-}$

D. $S_2O_6^{2-}$

Answer: C

Watch Video Solution

3. The number of moles of $K_2Cr_2O_7$ reduced by $1mol$ of Sn^{2+} ions is

A. $2/3$

B. $1/6$

C. $1/3$

D. 1

Answer: C

Watch Video Solution

4. Which of the following solutions will exactly oxidize $25mL$ of an acid solution of $0.1MFe\ (II)$ oxalate?

A. $25mL$ of $0.1MKMnO_4$

B. $25mL$ of $0.2MKMnO_4$

C. $25mL$ of $0.6MKMnO_4$

D. $15mL$ of $0.1MKMnO_4$

Answer: D

Watch Video Solution

5. How many moles of O_2 will be liberated by one mole of CrO_5 is the following reaction:

$$CrO_5 + H_2SO_4 \rightarrow Cr_2(SO_4)_3 + H_2O + O_2$$

A. $5/2$

B. $5/4$

C. $9/2$

D. $7/2$

Answer: D

Watch Video Solution

6. $50mL$ of $0.1M$ solution of a salt reacted with $25mL$ of $0.1M$ solution of sodium sulphite. The half reaction for the oxidation of sulphite ion is:

$SO_3^{2-}(aq) + H_2O(l) \rightarrow (aq) + 2H^+(aq) + 2e^-$

If the oxidation number of metal in the salt was 3, what would be the new oxidation number of metal:

A. zero

B. 1

C. 2

D. 4

Answer: C

Watch Video Solution

7. $4.9g$ of $K_2Cr_2O_7$ is taken to prepare $0.1L$ of the solutio. $10mL$ of this solution is further taken to oxidise Sn^{2+} ion into $Sn^{4+}ion$ so produced is used in second reaction to prepare Fe^{3+} ion then the millimoles of Fe^{3+} ion formed will be (assume all other components are in sufficient amount)[Molar mass of $K_2Cr_2O_7 = 294g$].

A. 5

B. 20

C. 10

D. none of these

Answer: C

Watch Video Solution

8. One gram of Na_3AsO_4 is boiled with excess of solid KI in presence of strong HCl. The iodine evolved is absorbed in KI solution and titrated against $0.2N$ hyposolution. Assuming the reaction to be

$$AsO_4^{3-} + 2H^+ + 2I^- \rightarrow AsO_3^{2-} + H_2O + I_2,$$

calculate the volume of thiosilphate hypo consumed. [Atomic weight of $As = 75$]

A. $48.1mL$

B. $38.4mL$

C. $24.7mL$

D. $30.3mL$

Answer: A

Watch Video Solution

9. $25mL$ of $0.50MH_2O_2$ solution is added to $50mL$ of $0.20MKMnO_4$ is acid solution. Which of the following statements is true?

A. 0.010 mole of oxygen is liberated

B. 0.005 mole of $KMnO_4$ are left

C. $0.030g$ atom of oxygen gas is evolved

D. 0.0025 mole H_2O_2 does not react with $KMnO_4$

Answer: B

Watch Video Solution

10. $0.80g$ of sample of impure potassium dichromate was dissolved in water and made up to $500mL$ solution. $25mL$ of this solution treated with excess of KI in acidic medium and I_2 liberated required $24mL$ of a sodium thiosulphate solution. $30mL$ of this sodium thiosulphate

solution required $15mL$ of $N/20$ solution of pure potassium dichromate. What was the percentage of $K_2Cr_2O_7$ in given sample?

A. $73.5\ \%$

B. $75.3\ \%$

C. $36.75\ \%$

D. none of these

Answer: A

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11. One mole of $CaOCl_2$ is dissolved in water andexcess of KI added. $Hypo(Na_2S_2O_3)$ required to react with the oxidised part completely is

A. 1 mole

B. 2.0 moles

C. 1.5 moles

D. 2.5 moles

Answer: B

Watch Video Solution

12. An element A in a compound ABD has oxidation number A^{n-}. It is oxidised by $Cr_2O_7^{2-}$ in acid medium. In the experiment 1.68×10^{-3} moles of $K_2Cr_2O_7$ were used for 3.26×10^{-3} moles of ABD. The new oxidation number of A after oxidation is:

A. 3

B. $3 - n$

C. $n - 3$

D. $+n$

Answer: B

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13. The number of moles of $KMnO_4$ reduced by $1\text{mol of}KI$ in alkaline medium is

A. One-fifth

B. five

C. One

D. Two

Answer: D

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14. $0.3g$ of an oxalate salts was dissolved in $100mL$ solution. The solution required $90mL$ of $N/20KMnO_4$ for complete oxidation. The $\%$ of oxalate ion in salt is:

A. $3.3\ \%$

B. $66\ \%$

C. $70\ \%$

D. $40\ \%$

Answer: B

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15. How many litres of a $0.5N$ solution of an oxidising agent are reduced by 2 litres of a $2.0N$ solution of a reducing agent?

A. 8

B. 4

C. 6

D. 7

Answer: A

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16. During the disproportionation of I_2 to iodide and iodate ions, the ratio of iodate and iodide ions formed in alkaline medium is

A. $1:5$

B. $5:1$

C. $3:1$

D. $1:3$

Answer: A

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17. If $25.8ml$ of $0.101MK_2Cr_2O_7$ is required to titrate $10.0ml$ of a liquid iron supplement, calculate the concentration of iron in vitamin solution

A. $0.780M$

B. $0.261M$

C. $4.35 \times 10^{-4}M$

D. $1.56M$

Answer: D

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18.

$28NO_3^- + 3As_2S_3 + 4H_2O \rightarrow 6AsO_4^{3-} + 28NO + 9SO_4^{2-} + H^+$

What will be the equivalent mass of As_(2)S_(3)` in the above reaction?

A. $\frac{M.\ wt.}{2}$

B. $\frac{M.\ wt.}{4}$

C. $\frac{M.\ wt.}{24}$

D. $\frac{M.\ wt.}{28}$

Answer: D

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19. Moles of KHC_2O_4 (potassium acid oxalate) required to reduce 100ml of 0.02M $KMnO_4$ in acidic medium (to Mn^{2+}) is :

A. $x = y$

B. $2x = y$

C. $x = 2y$

D. none is correct

Answer: A

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20. The number of moles of $K_2Cr_2O_7$ that will be needed to react completely with one mole of ferric sulphite in acidic medium is

A. 0.4

B. 0.6

C. 1.0

D. 0.8

Answer: C

Watch Video Solution

21. $100mL$ of mixture of $NaOH$ and Na_2SO_4 is neutralised by $10mL$ of $0.5MH_2SO_4$. Hence, NaOH in $100mL$ solution is

A. $0.2g$

B. $0.4g$

C. $0.6g$

D. none of these

Answer: B

Watch Video Solution

22. A $0.518g$ sample of limestone is dissolved in HCl and then the calcium is precipitated as CaC_2O_4. After filtering and washing the precipitate, it requires 40.0 filtering and washing the precipitate, it requires $40.0mL$ of $0.250NKMnO_4$, solution acidified with H_2SO_4

to titrate it as. The percentage fo CaO in the sample is:

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

A. $54.0\,\%$

B. $27.1\,\%$

C. $42\,\%$

D. $84\,\%$

Answer: A

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23. $25ml$ of a $0.1(M)$ solution of a stable cation of transition metal z reacts exactly with $25ml$ of $0.04(M)$ acidified $KMnO_4$ solution. Which of the following is most likely to represent the change in oxidation state of Z correctly?

A. $Z^+ \rightarrow Z^{2+}$

B. $Z^{2+} \rightarrow Z^{3+}$

C. $Z^{3+} \rightarrow Z^{4+}$

D. $Z^{2+} \rightarrow Z^{4+}$

Answer: D

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24. For decolourisation of $1\text{mol of} KMnO_4$, the moles of H_2O_2 required is

A. $1/2$

B. $3/2$

C. $5/2$

D. $7/2$

Answer: C

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25. In alkaline medium, ClO_2 oxidises $H_2O_2 \text{to} O_2$ and is itself reduced to $Cl^{\ominus}$. How many moles of H_2O_2 are oxidised by $1 \text{mol of } ClO_2$?

A. 1.0

B. 1.5

C. 2.5

D. 3.5

Answer: C

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26. If equal volumes of $0.1MKMnO_4$ and $0.1MK_2Cr_2O_7$ solutions are allowed to oxidise Fe^{2+} to Fe^{3+} in acidic medium, then Fe^{2+} oxidised will be:

A. more by $KMnO_4$

B. more by K_2CrO_7

C. equal in both cases

D. can't be determined

Answer: B

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27. If $10g$ of V_2O_5 is dissolved in acid and is reduced to V^{2+} by zinc metal, how many mole I_2 could be reduced by the resulting solution if it is further oxidised to VO^{2+} ions? [Assume no change in state of Zn^{2+} ions] ($V = 51, O = 16, I = 127$)

A. 0.11 mole of I_2

B. 0.22 mole of I_2

C. 0.055 mole of I_2

D. 0.44 mole of I_2

Answer: A

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28. $0.45g$ of acid (mol. Wt. $= 90$) was exactly neutralized by $20ml$ of $0.5(M)NaOH$.

The basicity of the given acid is

A. 1

B. 2

C. 3

D. 4

Answer: B

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29. During the oxidation of arsenite to arsenate ion in alkaline medium, the number of moles of hydroxide ions involved per mole of arsenite ion are

A. 2

B. 3

C. $2/3$

D. None of these

Answer: A

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30. $KMnO_4$ (purple) is reduced to K_2MnO_4 (green) by SO_3^{2-} in basic medium. 1 mole of $KMnO_4$ is reduced by

A. 1 mole of SO_3^{2-}

B. 2 mole of SO_3^{2-}

C. 1.5 mole of SO_3^{2-}

D. 0.5 mole of SO_3^{2-}

Answer: D

Watch Video Solution

31. In an experiment $50ml$ of $0.1(M)$ solution of a salt is reacted with $25ml$ of $0.1(M)$ solution of sodium sulphite. The half equation for the oxidation of sulphite ion is $SO_3^{2-}(aq) + H_2O \rightarrow SO_4^{2-}(aq) + 2H^+(aq) + 2e^-$ If the oxidation number of metal in the salt was 3, what would be the new oxidation number of metal?

A. 0

B. 1

C. 2

D. 4

Answer: C

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32. How many litres of Cl_2 at STP will be liberated by the oxidation of $NaCl$ with $10gKMnO_4$ in acidic medium: (Atomic weight: $Mn = 55$ and $K = 39$)

A. $3.54 litres$

B. $7.08 litres$

C. $1.77 litres$

D. none of these

Answer: A

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Watch Video Solution

33. When the ion $Cr_2O_7^{2-}$ acts as an oxidant in acidic aqueous solution the ion Cr^{3+} is formed. How many mole of Sn^{2+} would be oxidised to Sn^{4+} by one mole $Cr_2O_7^{2-}$ ion:

A. $2/3$

B. $3/2$

C. 2

D. 3

Answer: D

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34. MnO_4^{2-} (1 mole) in neutral aqueous medium is disproportionate to

A. $2/3$ mole of MnO_4^- and $1/3$ mole of MnO_2

B. $1/3$ mole of MnO_4^- and $2/3$ mole of MnO_2

C. $1/3$ mole of Mn_2O_7 and $1/3$ mole of MnO_2

D. $2/3$ mole of Mn_2O_7 and $1/3$ mole of MnO_2

Answer: A

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35. What volume of 3 molar HNO_3 is needed to oxidise $8g$ of Fe^{3+}, HNO_3 gets converted to NO ?

A. $8ml$

B. $15.87ml$

C. $32ml$

D. $64ml$

Answer: B

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36. The number of moles of $KMnO_4$ that will be needed to react with one mole of ferrous sulphite in acidic solution is

A. 0.6

B. 0.4

C. 0.8

D. 1.0

Answer: A

Watch Video Solution

37. How many litres of Cl_2 at STP will be liberated by the oxidation of $NaCl$ with $10gKMnO_4$ in acidic medium: (Atomic weight: $Mn = 55$ and $K = 39$)

A. $3.54 litres$

B. $7.08 litres$

C. $1.77 litres$

D. none of these

Answer: A

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38. HNO_3 oxidies NH_4^+ ions to nitrogen and itself gets reduced to NO_2. The moles of HNO_3 required by 1 mole of $(NH_4)_2SO_4$ is:

A. 4

B. 5

C. 6

D. 2

Answer: C

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39. What volume (in ml) at STP of SO_2 gas is oxidized by $100ml$ of $0.1(M)H_2Cr_2O_7$ in acid solution?

A. $672ml$

B. $224ml$

C. $448ml$

D. $112ml$

Answer: A

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40. What mass of N_2H_4 can be oxidised to N_2 by $24g$ of K_2CrO_4 which is reduced to $Cr(OH)_4^-$?

A. $2.969g$

B. $5.25g$

C. $9.08g$

D. $29.69g$

Answer: A

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

A. $1/5$

B. $2/5$

C. $5/2$

D. 5

Answer: C

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42. Starch iodide paper is used to test for the presence of

A. Reducing agent

B. Oxidising agent

C. Iodide ion

D. Iodine

Answer: D

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43. What weight of HNO_3 is needed to convert $5g$ of iodine into iodic acid according to the reaction,

$I_2 + HNO_3 \rightarrow HIO_3 + NO_2 + H_2O$

A. $12.205g$

B. $24.8g$

C. $0.248g$

D. $49.6g$

Answer: A

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44. The molar ration of Fe^{++} to Fe^{+++} in a mixture of $FeSO_4$ and $Fe_2(SO_4)_3$ having equal number of sulphate ions in both ferrous and ferric sulphate is:

A. $1:2$

B. $3:2$

C. $2:3$

D. can't be determined

Answer: B

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Type Of Redox Reaction And Equivalent Weight

1. Which is the best description of the behaviour of bromine in the reaction given below

$H_2O + Br_2 \rightarrow HOBr + HBr$

A. Oxidised only

B. Reduced only

C. Proton acceptor only

D. Both oxidised and reduced

Answer: D

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2. Equivalent weight of NH_3 as a base is

A. 17

B. $17/3$

C. 1.7

D. $17/2$

Answer: A

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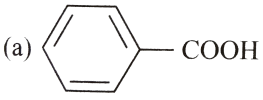
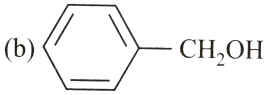
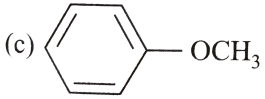
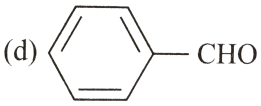
3. Equivalent weight of C_6H_5CHO is equal to molar mass in the following reaction.

Thus, species (A) is

A. 

B. 

C. 

D. 

Answer: B

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4. In the reaction $VO + Fe_2O_3 \rightarrow FeO + V_2O_5$, the eq.wt. of V_2O_5 is equal to its

A. Mol.Wt.

B. Mol.Wt. $/8$

C. Mol.Wt. $/6$

D. None of these

Answer: C

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5. Equivalent weight of H_3PO_2 in a reaction is found to be half of its molecular weight. It can be due to its

A. oxidation to H_3PO_3

B. reaction of two H^+ ions

C. oxidation to H_3PO_4

D. reduction to PH_3

Answer: A

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6. The eq.wt. of $Fe_2(SO_4)_3$, the salt to be used as an oxidant in an acid solution is

A. $(mol.\ wt.)/1$

B. $(mol.\ wt.)/2$

C. $(mol.\ wt.)/3$

D. $(mol.\ wt.)/5$

Answer: B

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7. The equivalent weight of FeC_2O_4 in the change

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

A. M

B. $M/2$

C. $M/3$

D. $2M/3$

Answer: C

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8. What volume of O_2 measured at standard condition will be formed by the action of $100mL$ of $0.5NKMnO_4$ on hydrogen peroxide in an acid solution?

The skeleton equation for the reaction is,

$KMnO_4 + H_2SO_4 + H_2O_2 \rightarrow KHSO_4 + MnSO_4 + H_2O + O_2$

A. $0.12L$

B. $0.28L$

C. $0.56L$

D. $1.12L$

Answer: B

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9. The equivalent weight of $MnSO_4$ is half its molecular weight when it is converted to

A. Mn_2O_3

B. MnO_2

C. MnO_4^-

D. MnO_4^{2-}

Answer: B

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10. Equivalent weight of $K_2Cr_2O_7$ in the following reaction is

$Cr_2O_7^{2-} Fe^{2+} \rightarrow Fe^{3+} Cr^{3+}$

($M = molarmass$ of $K_2Cr_2O_7$)

A. $\frac{M}{3}$

B. $\frac{M}{6}$

C. $\frac{M}{5}$

D. $\frac{M}{4}$

Answer: B

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11. Which of the following reaction is a redox reaction?

A. $P_2O_5 + 2H_2O \rightarrow H_4P_2O_7$

B. $2AgNO_3 + BaCl_2 \rightarrow 2AgCl + Ba(NO_3)_2$

C. $BaCl_2 + H_2sO_4 \rightarrow BaSO_4 + 2HCl$

D. $Cu + 2AgNO_3 \rightarrow 2Ag + Cu(NO_3)_2$

Answer: D

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12. In the equation $H_2S + 2HNO_3 \rightarrow 2H_2O + 2NO_2 + S$ The equivalent weight of hydrogen sulphide is

A. 17

B. 68

C. 34

D. 16

Answer: A

Watch Video Solution

13. In the following reaction,

$2H_2S(g) + SO_2(g) \rightarrow 3S(s) + 2H_2O(l)$

One equivalent of $H_2S(g)$ will reduce

A. 1 mol SO_2

B. 0.25 mol SO_2

C. 0.5 mol SO_2

D. 2 mol SO_2

Answer: B

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14. 0.05 moles of $NaHCO_3$ will react with how many equivalent of $Mg(OH)_2$?

A. 0.2 equivalent

B. 0.05 equivalent

C. 0.02 equivalent

D. 0.01 equivalent

Answer: B

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15. Equivalent weight of S in SO_3^{2-} is $(S = 32)$

A. 6

B. 8

C. 9

D. 4

Answer: B

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16. The equivalent weight of $MnSO_4$ is half its molecular weight when it is converted to

A. Mn_2O_3

B. MnO_4^-

C. MnO_2

D. MnO_4^{2-}

Answer: C

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17. In the reaction,

$I_2 + 2S_2O_3^{2-} \rightarrow 2I^- + S_4O_6^{2-}$.

Equivalent wieght of iodine will be equal to

A. its molecular weight

B. $1/2$ of its molecular weight

C. $1/4$ of its molecular weight

D. twice of its molecular weight

Answer: B

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18. Which has maximum number of equivalent per mole of the oxidant?

A. $I^-(aq) + IO_3^-(aq) \rightarrow I_3^-(aq)$

B. $Ag(s) + NO_3^-(aq) \rightarrow NO_2(g) + Ag^+(aq)$

C. $Mg(s) + VO_4^{3-}(aq) \rightarrow Mg^{2+}(aq) + V^{3+}(aq)$

D. $Zn(s) + VO^{2+}(aq) \rightarrow V^{3+}(aq) + Zn^{2+}(aq)$

Answer: A

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19. The equivalent weight of $Mohr$'s salt $FeSO_4.(NH_4)_2SO_4.6H_2O$ in redox change is equal to its

A. molecular weight $/2$

B. atomic weight

C. molecular weight $/3$

D. molecular weight

Answer: D

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20. In alkaline medium , $KMnO_4$ reacts as follows

$2KMnO_4 + 2KOH \rightarrow 2K_2MnO_4 + H_2O + O$

Therefore, the equivalent mass of $KMnO_4$ will be

A. 31.6

B. 52.7

C. 7.0

D. 158.0

Answer: D

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21. An element forms an oxide, in which the oxygen is 20% of the oxide by weight, the equivalent weight of the given element will be

A. 32

B. 40

C. 60

D. 128

Answer: A

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22. Photosynthesis of carbohydrates in plants takes place as

$$6CO_2 + 12H_2O \xrightarrow{Sunlight} C_6H_{12}O_6 + 6O_2 + 6H_2O$$

Equivalent weights of CO_2 and $C_6H_{12}O_6$ respectively are

A. $11, 7.5$

B. $44, 90$

C. $22, 15$

D. $44, 180$

Answer: A

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23. The equivalent weight of phosphoric acid (H_3PO_4) in the reaction $NaOH + H_3PO_4 \rightarrow NaH_2PO_4 + H_2O$ is

A. 25

B. 98

C. 59

D. 49

Answer: B

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24. The equivalent weight of KIO_3 in the reaction $2Cr(OH)_3 + 4OH + KIO_3 \rightarrow 2CrO_4^{2-} + 5H_2O + KI$ is

A. $\frac{Mol.\ wt.}{3}$

B. $\frac{Mol.\ wt.}{6}$

C. $\frac{Mol.\ wt.}{2}$

D. Molecular weight

Answer: A

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25. What is the equivalent weight of HNO_3 in the given reaction?

$4Zn + 10HNO_3 \rightarrow 4Zn(NO_3)_2 + NH_4NO_3 + 3H_2O$

A. $\frac{63}{10}$

B. $\frac{63}{9}$

C. $\frac{63}{8} \times 10$

D. $\frac{63}{4} \times 14$

Answer: C

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26. In the following reaction (unbalanced), equivalent weight of As_2S_3 is related to molecular weight M by

$$As_2S_3 + H + NO_3^- \rightarrow NO + H_2O + AsO_4^{3-} + SO_4^{2-}$$

A. $\frac{M}{2}$

B. $\frac{M}{4}$

C. $\frac{M}{28}$

D. $\frac{M}{24}$

Answer: C

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27. What is the equivalent weight of $C_{12}H_{22}O_{11}$ in the following reaction?

$$C_{12}H_{22}O_{11} + 36HNO_3 \rightarrow 6H_2C_2O_4 + 36NO_2 + 23H_2O$$

A. $\frac{342}{36}$

B. $\frac{342}{12}$

C. $\frac{342}{22}$

D. $\frac{342}{3}$

Answer: A

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28. In the following disproportionation of Cl_2 in basic medium

$$Cl_2 + 2KOH \rightarrow KCl + KClO + H_2O$$

Equivalent mass of Cl_2 is

A. 35.50

B. 71.00

C. 47.33

D. 11.83

Answer: B

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29. What is the equivalent weight of P in the following reaction?

$P_4 + NaOH \rightarrow NaH_2PO_2 + PH_3$

A. $\frac{31}{4}$

B. $\frac{31}{3}$

C. $\frac{31}{2}$

D. $31 \times 4/3$

Answer: D

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30. Equivalent mass of oxidizing agent in the reaction,

$SO_2 + 2H_2S \rightarrow 3S + 2H_2O$ is

A. 32

B. 64

C. 16

D. 8

Answer: C

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31. Equivalent weight of H_3PO_2 when it disproportionates into PH_3 and H_3PO_3 is (mol.wt. of $H_3PO_2 = M$)

A. M

B. $\frac{3M}{4}$

C. $\frac{M}{2}$

D. $\frac{M}{4}$

Answer: B

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32. In the following unbalanced redox reaction,

$$Cu_3P + Cr_2O_7^{2-} \rightarrow Cu^{2+} + H_3PO_4 + Cr^{3+}$$

Equivalent weight of H_3PO_4 is

A. $\frac{M}{3}$

B. $\frac{M}{6}$

C. $\frac{M}{7}$

D. $\frac{M}{8}$

Answer: D

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33. $5L$ of $KMnO_4$ solution contains 0.01 equiv. of $KMnO_4$. $50ml$ of the given solution contain, how many moles of $KMnO_4$?

$KMnO_4 \rightarrow MnO_2$

A. $\frac{10^{-6}}{4}$

B. $\frac{10^{-4}}{3}$

C. 3×10^{-5}

D. 10^{-5}

Answer: B

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34. What is the equivalent mass of IO_4^- when it is converted into I_2 in acid medium ?

A. $M/6$

B. $M/7$

C. $M/5$

D. $M/4$

Answer: B

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35. The reaction

$$3ClO^{\ominus}(aq) \rightarrow ClO_3(aq) + 2Cl^{\ominus}(aq)$$

is an example of

A. Oxidation reaction

B. reduction reaction

C. disproportionation reaction

D. decomposition reaction

Answer: C

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36. Which reaction does not represent auto-redox or disproportionation?

A. $Cl_2 + OH^- \rightarrow Cl^- + ClO_3^- + H_2O$

B. $2H_2O_2 \rightarrow H_2O + O_2$

C. $2Cu^+ \rightarrow Cu^{2+} + Cu$

D. $(NH_4)_2Cr_2O_7 \rightarrow N_2 + Cr_2O_3 + 4H_2O$

Answer: D

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37. Which of the following species does not show disproportionation reaction?

A. ClO_4^-

B. ClO_2^-

C. ClO_3^-

D. ClO^-

Answer: A

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38. Among the following select the disproportionation reaction ?

(i) $2Pb(NO_3)_2 \rightarrow 2PbO + 4NO_2 + O_2$

(ii) $I_2 \rightarrow I^- + IO_3^-$

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

(iv) $P_4 + 3NaOH + 3H_2O \rightarrow 3NaH_2PO_2 + PH_3$

A. $(i), (ii), (iii)$

B. $(ii), (iii), (iv)$

C. $(i), (iii), (iv)$

D. All of these

Answer: B

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39. Which is the intramolecular oxidation-reduction reaction?

A. $2KClO_3 \rightarrow 2KCl + 3O_2$

B. $(NH_4)_2Cr_2O_7 \rightarrow N_2 + CrO_3 + 4H_2O$

C. $PCl_5 \rightarrow PCl_3 + Cl_2$

D. All of the above

Answer: D

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40. Based on the following reaction,

$XeO_6^{4-}(aq) + 2F^-(aq) + 6H^+(aq) \rightarrow XeO_3(aq) + F_2(g) + 3H_2O(l)$

$(\Delta(G)^\circ < o)$

It can be concluded that

A. oxidising power of F^- is grater than that of XeO_6^{4-}

B. it is not a redox reaction

C. it is a disproportionation reaction

D. oxidising power of XeO_6^{4-} is greater than that of F^-

Answer: D

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41. Equivalent weight of N_2 in the change

$N_2 \rightarrow NH_3$ is

A. $28/6$

B. 28

C. $28/2$

D. $28/3$

Answer: A

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42. What is the equivalent weight of NH_3 in the given reaction?

$3CuO + 2NH_3 \rightarrow 3Cu + N_2 + 3H_2O$

A. 17

B. $\frac{17}{4}$

C. $\frac{17}{2}$

D. $\frac{17}{3}$

Answer: D

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Section B Assertion Reasoning

1. Assertion (A): SO_2 and Cl_2 are both bleaching agents.

Reason (R): Both are reducing agents.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explantion of the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: C

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2. Assertion(A): Fluorine exists only in -1 oxidation state.

Reason(R): Fluorine has $2s^2 2p^5$ configuration.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explantion of the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: B

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3. Assertion: Stannous chloride is a powerful oxidising agent which oxidises mercuric chloride to mercury

Reason: Stannous chloride gives grey precipitate with mercuric chloride, but stannic chloride does not do so.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explantion of the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: D

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4. Assertion: $HClO_4$ is a stronger acid than $HClO_3$.

Reason: Oxidation state of Cl in $HClO_4$ is $+VII$ and in $HClO_3 + V$.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explantion of the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: B

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5. Assertion: Copper liberates hydrogen from a solution of dilute hydrochloric acid.

Reason: Hydrogen is above copper in the electro- chemical series.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explantion of the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: D

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6. Assertion: Reaction of white phosphorus with $NaOH(aq)$ gives PH_3.

Reason: The reaction is disproportionation of P in alkaline medium.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explantion of the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A

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7. Assertion: The passage of H_2S through aqueous solution of SO_2 gives yellow turbidty of S in solution. Reason: The yellow turbidity of S is in colloidal state due to oxidation of H_2S by $SO_2(aq)$.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explantion of the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A

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8. Assertion: Bleaching action of SO_2 is temporary whereas bleaching action of Cl_2 is permanent.

Reason: Bleaching by SO_2 and Cl_2 is due to oxidation.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explantion of the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: C

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9. Assertion: Conversation of black lead painting is made to white by the action of H_2O_2.

Reason: Sulphur is oxidised to SO_4^{2-}

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explantion of the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A

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10. Assertion: CrO_5 on decomposition undergoes disproportionation.

Reason: CrO_5 undergoes intermolecular redox reaction.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explantion of the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: C

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11. Assertion: NH_4NO_3 on heating give N_2O.

Reason: NH_4NO_3 on heating shows disproportionation.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explantion of the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: C

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12. Assertion: In azide ion average oxidation number of N is $-1/3$.

Reason: In azide ion two N atoms have zero oxidation number and one has oxidation number -1.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explantion of the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A

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13. Assertion: Oxygen atom in both O_2 and O_3 has oxidation number zero.

Reason: In Fe_2O, oxidation number of O is $+2$.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explantion of the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: B

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14. Assertion: N atom has two different oxidation states in NH_4NO_2.

Reason: One N atom has $-ve$ oxidation number as it is attached with less electronegative H atom and other has $+ve$ oxidation number as it is attached with more electronegative atom.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explantion of the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A

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15. Statement $2H_2O_2 \rightarrow 2H_2O + O_2$ is autoredox change.

Explanation One oxygen atom is oxidised and one oxygen atom is reduced.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explantion of the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A

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16. Statement VO_2^+ and VO^{2+} both are called vanadyl ions.

Explanation VO_2^+ is dioxovanadium (V) ion and VO^{2+} is oxovanadium (IV) ion.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explantion of the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: B

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17. Assertion: In the reaction,

$3As_2S_3 + 28HNO_3 + 4H_2O \rightarrow 6H_3SAsO_4 + 9H_2SO_4 + 28NO$

electrons transferred are 84.

Reason: As is oxidised from $+3$ to $+5$ and sulphur from -2 to $+6$.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explantion of the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A

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18. Assertion: If a strong acid is added to a solution of potassium chromate it changes its colour from yellow to orange.

Reason: The colour change is due to the oxidation of potassium chromate.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explantion of the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: C

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19. Assertion: Nitrous acid (HNO_2) may act as an oxidising as well as a reducing agent.

Reason: The oxidation number of nitrogen remains same in all the compounds.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explantion of the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: C

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20. Assertion: A reducing agent is a substance which can donate electron.

Reason: A substance which helps in oxidation is known as reducing agent.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explantion of the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: C

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21. Assertion: In the redox reaction $8H^+(aq) + 4NO_3^- + 6Cl^- + Sn(s) \rightarrow SnCl_6^{2-} + 4NO_2 + 4H_2O$. the reducing agent is $Sn(s)$.

Reason In balacing half-reaction, $S_2O_3^{2-} \rightarrow S(s)$, the number of electrons added on the left is 4.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explantion of the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: B

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22. Assertion: Among Br^-, O_2^{2-}, H^- and NO_3^-, the ions that cannot act as oxidising agents are Br^- and H^-.

Reason: Br^- and H^- cannot be reduced.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explantion of the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A

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23. Assertion: In the reaction, $MnO_4^- + 5Fe^{2+} + 8H + \rightarrow Mn^{2+} + 5Fe^{3+} + 4H_2O$, MnO_4^- acts as oxidising agent.

Reason: In the above reaction, n- factor is 5.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explantion of the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: B

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24. Assertion: If $200mL$ of $0.1NNaOH$ is added to $200mL$ of $0.1NH_2SO_4$ solution. Then the resulting solution is acidic.

Reason: If milliequivalent of acid is greater than milliequivalents of base, then upon mixing the solution is acidic.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explantion of the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: D

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25. Assertion: Equivalent weight of FeC_2O_4 in the reaction, $FeC_2O_4 +$ Oxidising agent $\rightarrow Fe^{3+} + CO_2$ is $M/3$, where M is molar mass of FeC_2O_4.

Reason: In theabove reaction, total two mole of electrons are given up by $1mole$ of FeC_2O_4 to the oxidising agent.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explantion of the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: C

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Aipmt Neet Questions

1. Zn gives H_2 gas with H_2SO_4 and HCl but not with HNO_3 because

A. Zn acts as an oxidising agent when it reacts with HNO_3

B. HNO_3 is weaker acid than H_2SO_4 and HCl

C. In electrochemical series, Zn is above hydrogen

D. NO_3^{Θ} is reduced in preference to hydronium ion.

Answer: D

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2. The oxidation states of sulphur in the anions SO_3^{2-}, $S_2O_4^{2-}$, and $S_2O_6^{2-}$ follow the order

A. $S_2O_4^{2-} < SO_3^{2-} < S_2O_6^{2-}$

B. $SO_3^{2-} < S_2O_4^{2-} < S_2O_6^{2-}$

C. $S_2O_4^{2-} < S_2O_6^{2-} < SO_3^{2-}$

D. $S_2O_6^{2-} < S_2O_4^{2-} < SO_3^{2-}$

Answer: A

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3. Which is the best description of the behaviour of bromine in the reaction given below

$H_2O + Br_2 \rightarrow HOBr + HBr$

A. Proton acceptor only

B. Both oxidised and reduced

C. Oxidised only

D. Reduced only

Answer: B

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4. 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 ,

A. $-3, +6, +6$

B. $+5, +3, +6$

C. $+3, +6, +5$

D. $+5, +6, +6$

Answer: D

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5. Oxidation no. of P in $H_4P_2O_5$, $H_4P_2O_6$, and $H_4P_2O_7$ are respectively

A. $+3, +4, +5$

B. $+4, +3, +5$

C. $+3, +5, +4$

D. $+5, +3, +4$

Answer: A

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6. The most common and stable oxidation state of a lanthanide is

A. 4

B. 2

C. 5

D. 3

Answer: D

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7. Standard reduction potentails of the half reactions are given below:

$F_2(g) + 2e^- \rightarrow 2F^-(aq.),, E^\ominus = +2.87$

$Cl_2(g) + 2e^- \rightarrow 2Cl^-(aq.),, E^\ominus = +1.36V$

$Br_2(g) + 2e^- \rightarrow 2Br^-(aq.),, E^\ominus = +1.09V$

$I_2(s) + 2e^- \rightarrow 2l^-(aq.),, E^\ominus = +0.54V$

The strongest oxidizing and reducing agents respectively are:

A. F_2 and I^-

B. Br_2 and Cl^-

C. Cl_2 and Br^-

D. Cl_2 and I_2

Answer: A

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

A. N_3H

B. NH_2OH

C. N_2H_4

D. NH_3

Answer: A

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

A. Zero to -1 and zero to $+3$

B. Zero to $+1$ and zero to -3

C. Zero to $+1$ and zero to -5

D. Zero to -1 and zero to $+5$

Answer: D

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10. A mixture of potassium chlorate, oxalic acid and sulphuric acid is heated. During the reaction which element undergoes maximum change in the oxidation number?

A. Cl

B. C

C. S

D. H

Answer: A

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11. The pair of compounds that can exist together is:

A. $FeCl_3, SnCl_2$

B. $HgCl_2, SnCl_2$

C. $FeCl_2, SnCl_2$

D. $FeCl_3, KI$

Answer: C

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12. Role of hydrogen peroxide iin the following reaction is respectively.

$(i) \quad H_2O_2 + O_3 \rightarrow H_2O + ZO_2$

$(ii) \quad H_2O_2 + Ag_2O \rightarrow Aag + H_2O + O_2$

A. oxidizing in (I) and reducing in (II)

B. reducing in (I) and oxidizing in (II)

C. reducing in (I) and (II)

D. oxidizing in (I) and (II)

Answer: A

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13. 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

A. $+5$

B. $+3$

C. $+6$

D. -10

Answer: C

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14. The reaction of aqueus $KMnO_4$ with H_2O_2 in acidic conditions gives

A. Mn^{4+} and O_2

B. Mn^{2+} and O_2

C. Mn^{2+} and O_3

D. Mn^{4+} and MnO_2

Answer: B

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15. For the redox reaction

$$MnO_4^{\ominus} + C_2O_4^{2-} + H^{\oplus} \rightarrow Mn^{2+} + CO_2 + H_2O$$

the correct coefficients of the reactions for the balanced reaction are

A. $(1MnO_4^- = 16, C_2O_4^{2-} = 5, H^+ = 2)$

B. $(1MnO_4^- = 2, C_2O_4^{2-} = 5, H^+ = 16)$

C. $(1MnO_4^- = 2, C_2O_4^{2-} = 16, H^+ = 5)$

D. $(1MnO_4^- = 5, C_2O_4^{2-} = 16, H^+ = 2)$

Answer: B

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16. Which ordering of compound is according to the decreasing order of the oxidation state of nitrogen?

A. HNO_3, NO, N_2, NH_4Cl

B. HNO_3, NO, NH_4Cl, N_2

C. HNO_3, NH_4Cl, NO, N_2

D. NH_{4Cl}, N_2, NO, HNO_3

Answer: A

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Aiims Questions

1. Following reaction describes the rusting of iron

$4Fe + 3O_2 \rightarrow 4Fe^{3+} + 6O_2$_

Which one of the following statements is incorrect?

A. This is an example of a redox reaction

B. Metallic iron is reduced to Fe^{3+}

C. Fe^{3+} is an oxidising agent

D. Metallic iron is a reducing agent

Answer: B

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2. Identify the correct statement about H_2O_2

A. It acts as reducing agent only

B. It acts as both ocidising and reducing agent

C. It is neither an oxidiser nor reduces

D. It acts as oxidising agent only

Answer: B

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3. In $C + H_2O \rightarrow CO + H_2$, H_2O acts as

A. oxidising agent

B. reducing agent

C. both (a) and (b)

D. none of these

Answer: A

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4. Which substance is serving as a reducing agent in the following reaction?

$$14H^{+} + Cr_2O_7^{2-} + 3Ni \rightarrow 2Cr^{3+} + 7H_2O + 3Ni^{2+}$$

A. H_2O

B. Ni

C. H^{+}

D. $Cr_2O_7^{2-}$

Answer: B

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5. HNO_2 acts both as reductant and as oxidant, while HNO_3 acts only as oxidant. It is due to their

A. Solubility ability

B. Maximum oxidation number

C. Minimum oxidation number

D. Minimum number of valence electrons

Answer: B

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6. Oxidation number if nickel in $Ni(CO_4)$ is

A. 0

B. $+4$

C. -4

D. $+2$

Answer: A

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7. The oxidation number of carbon in CH_2Cl_2 is

A. 0

B. $+2$

C. -2

D. $+4$

Answer: A

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8. Which of the following statements is correct?

A. Hydrogen has oxidation number -1 and $+1$

B. Hydrogen has same electronegativity as halogens

C. Hydrogen will not be liberated at anode

D. Hydrogen has same ionization potential as alkali metals

Answer: A

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9. An element which never has a positive oxidation number in any of its compounds

A. Boron

B. Oxygen

C. Chlorine

D. Fluorine

Answer: D

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10. If HNO_3 changes into N_2O, the oxidation number is changed by

A. $+2$

B. -1

C. 0

D. $+4$

Answer: D

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11. The oxidation number of iron in the compound $K_4\left[Fe(CN)_6\right]$ is

A. $+6$

B. $+4$

C. $+3$

D. $+2$

Answer: D

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12. The brown ring complex compound is formulated as $\left[Fe(H_2O)_5NO\right]SO_4$. The oxidation state of Fe is

A. 1

B. 2

C. 3

D. 0

Answer: B

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

A. $\frac{2}{3}$

B. $\frac{3}{2}$

C. $\frac{3}{5}$

D. $\frac{5}{2}$

Answer: D

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14. Identify the element which can have highest oxidation numbers

A. N

B. O

C. Cl

D. C

Answer: C

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15. What is the net charge on ferrous ion ?

A. $+2$

B. $+3$

C. $+4$

D. $+5$

Answer: A

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16. Which of the following reaction involves oxidation reduction?

A. $H_2 + Br_2 \rightarrow 2HBr$

B. $HBr + AgNO_3 \rightarrow AgBr + HNO_3$

C. $NaBr + HCl \rightarrow NaCl + HBr$

D. $2NaOH + H_2SO_4 \rightarrow Na_2SO_4 + 2H_2O$

Answer: C

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17. What is the equivalent weight of phosphoric acid (H_3PO_4) according to the equation

$NaOH + H_3PO_4 \rightarrow NaH_2PO_4 + H_2O$

A. 25

B. 49

C. 59

D. 98

Answer: D

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18. For decolourisation of $1\text{mol of}KMnO_4$, the moles of H_2O_2 required is

A. $1/2$

B. $3/2$

C. $5/2$

D. $7/2$

Answer: C

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19. The oxidation number of sulphur in $H_2S_2O_7$ and iron in $K_4Fe(CN)_6$ is respectively

A. $+6$ and $+2$

B. $+2$ and $+2$

C. $+8$ and $+2$

D. $+6$ and $+4$

Answer: A

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20. MnO_4^{2-} in neutral aqueous medium is disproportionate to

A. $2/3$ mole of MnO_4^- and $1/3$ mole of MnO_2

B. $1/3$ mole of MnO_4^- and $2/3$ mole of MnO_2

C. $1/3$ mole of Mn_2O_7 and $1/3$ mole of MnO_2

D. $2/3$ mole of Mn_2O_7 and $1/3$ mole of MnO_2

Answer: A

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Assertion Reasoning Questions

1. Assertion: Amongest the halogens, fluorine can oxidise the elements to the highest oxidation- state.

Reason: Due to small size of fluoride ion, it is difficult to oxidise fluoride ion to fluorine. Hence reverse reaction takes place more easily.

A. If both the assertion and reason are true and reason is the true explanation of the assertion.

B. If both the assertion and reason are ture but the reason is not the correct explanation of assertion

C. If the assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: B

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2. Assertion: Cl_2 gas belaches the articles permanently.

Reason: Cl_2 is a strong reducing agent.

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3. Assertion: In some cases oxygen shows positive oxidation number though it is an electronegative element.

Reason: Fluorine is more electronegative than oxygen.

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4. Assertion: Reaction of SO_2 and H_2S in the presence of Fe_2O_3 catalyst gives elemental sulphur.

Reason: SO_2 is a reducing agent.

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5. Assertion: Cu is stronger reducing agent than H^+.

Reason: E^0 of Cu^{2+}/Cu is negative.

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Section D Chapter End Test

1. For H_3PO_3 and H_3PO_4 the correct choice is

A. H_3PO_3 is dibasic and reducing

B. H_3PO_3 is dibasic and non-reducing

C. H_3PO_4 is tribasic and reducing

D. H_3PO_3 is tribasic and non-reducing

Answer: A

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2. The oxidation number of sulphur in $H_2S_2O_7$ and iron in $K_4Fe(CN)_6$ is respectively

A. $+6$ and $+2$

B. $+2$ and $+2$

C. $+8$ and $+2$

D. $+6$ and $+4$

Answer: A

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3. One mole of N_2H_4 loses ten moles of electrons to form a new compound A. Assuming that all the nitrogen appears in the new compound, what is the oxidation state of nitrogen in A? (There is no change in the oxidation state of hydrogen.)

A. $+3$

B. -3

C. -1

D. $+5$

Answer: A

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4. In the compound $YBa_2Cu_3O_7$ which shows superconductivity, what is the oxidation state of Cu ?

Assume that the rare earth element yttrium is in its usual $+3$ oxidation state.

A. $3/7$

B. $7/3$

C. 3

D. 7

Answer: B

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5. The oxidation number of S in S_8, S_2F_2, and H_2S, respectively, are

A. $0, +1$ and -2

B. $+2, +1$ and -2

C. $0, +1$ and $+2$

D. $-2, +1$ and -2

Answer: A

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6. Which one of the following reactions is not an example of redox reaction?

A. $Cl_2 + 2H_2O + SO_2 \rightarrow 4H^+ + SO^{4-} 2Cl^-$

B. $Cu^{++} + Zn \rightarrow Zn^{++} + Cu$

C. $2H_2 + O_2 \rightarrow 2H_2O$

D. $HCl + H_2O \rightarrow H_3O^- + Cl^-$

Answer: D

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7. For the reaction, $C + O_2 \rightarrow CO_2, \Delta H = -393J$

$2Zn + O_2 \rightarrow 2ZnO, \Delta H = -412J$

A. Carbon can oxidise Zn

B. Oxidation of carbon is not feasible

C. Oxidation of Zn is not fesible

D. Zn can oxidise carbon

Answer: D

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8. In the reaction $B_2H_6 + 2KOH + 2X \rightarrow 2Y + 6H_2$, X and Y are respectively

A. H_2, H_3BO_3

B. HCl, KBO_3

C. H_2O, KBO_3

D. H_2O, KBO_2

Answer: D

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9. In a balanced equation $H_2SO_4 + xHI \rightarrow H_2S + YI_2 + zH_2O$, the value of x, y, z are

A. $x = 3, y = 5, z = 2$

B. $x = 4, y = 8, z = 5$

C. $x = 8, y = 4, z = 4$

D. $x = 5, y = 3, z = 4$

Answer: C

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10. MnO_4^{2-} (1 mole) in neutral aqueous medium is disproportionate to

A. $2/3$ mole of MnO_4^- and $1/3$ mole of MnO_2

B. $1/3$ mole of MnO_4^- and $2/3$ mole of MnO_2

C. $1/3$ mole of Mn_2O_7 and $1/3$ mole of MnO_2

D. $2/3$ mole of Mn_2O_7 and $1/3$ mole of MnO_2

Answer: A

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11. The conductivity of a saturated solution of $BaSO_4$ is $3.06 \times 10^{-6} \text{ohm}^{-1} cm^{-1}$ and its equivalent conductance is $1.53 \text{ohm}^{-1} cm^2 \equiv^{-1}$. The K_{sp} for $BaSO_4$ will be .

A. 4×10^{-12}

B. 2.5×10^{-9}

C. 2.5×10^{-13}

D. 4×10^{-6}

Answer: D

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12. H_2O_2 reduces $K_4Fe(CN)_6$

A. In neutral solution

B. In acidic solution

C. In non-polar solution

D. In alkaline solution

Answer: B

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13. When sodium metal is dissolved in liquid ammonia, blue colour solution is formed. The blue colour is due to

A. Solvated $Na^+ ions$

B. Solvated electrons

C. Solvated NH_2^- ions

D. Solvated protons

Answer: B

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14. Which of the following is redox reaction ?

A. H_2SO_4 with $NaOH$

B. In atmosphere, O_3 from O_2 by lightning

C. Evaporation of H_2O

D. Nitrogen oxides from nitrogen and oxygen by lightning

Answer: D

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15. In which of the following reactions H_2O_2 is a reducing agent?

A. $2FeCl_2 + 2HCl + H_2O_2 \rightarrow 2FeCl_3 + 2H_2O$

B. $Cl_2 + H_2O_2 \rightarrow 2HCl + O_2$

C. $2HI + H_2O_2 \rightarrow 2H_2O + I_2$

D. $H_2SO_3 + H_2O_2 \rightarrow H_2SO_4 + H_2O$

Answer: B

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16. Which is the best description of the behaviour of bromine in the reaction given below

$H_2O + Br_2 \rightarrow HOBr + HBr$

A. Oxidised only

B. Reduced only

C. Proton acceptor only

D. Both oxidised and reduced

Answer: D

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17. Which of the following substances acts as an oxidising as well as a reducing agent?

A. Na_2O

B. $SnCl_2$

C. Na_2O_2

D. $NaNO_2$

Answer: D

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18. When $K_2Cr_2O_7$ is converted to K_2CrO_4, the change in the oxidation state of chromium is

A. 0

B. 6

C. 4

D. 3

Answer: A

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19. Oxidation state of chlorine in perchloric acid is

A. -1

B. 0

C. -7

D. $+7$

Answer: D

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20. The oxidation number of S in $H_2S_2O_8$ is

A. $+2$

B. $+4$

C. $+6$

D. $+7$

Answer: C

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21. The oxidation state of nitrogen in N_3H is

A. $+\frac{1}{3}$

B. $+3$

C. -1

D. $-\frac{1}{3}$

Answer: D

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22. In XeO_3 and XeF_6 the oxidation state of Xe is

A. $+4$

B. $+6$

C. $+1$

D. $+3$

Answer: B

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23. The number of moles of $K_2Cr_2O_7$ reduced by $1mol$ of Sn^{2+} ions is

A. $1/3$

B. $1/6$

C. $2/3$

D. 1

Answer: A

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24. For the redox reaction

$$MnO_4^{\ominus} + C_2O_4^{2-} + H^{\oplus} \rightarrow Mn^{2+} + CO_2 + H_2O$$

the correct coefficients of the reactions for the balanced reaction are

A. $(MnO_4^- = 2), (C_2O_4^{2-} = 5), (H^+ = 16)$

B. $(MnO_4^- = 16), (C_2O_4^{2-} = 5), (H^+ = 2)$

C. $(MnO_4^- = 5), (C_2O_4^{2-} = 16), (H^+ = 2)$

D. $(MnO_4^- = 2), (C_2O_4^{2-} = 16), (H^+ = 5)$

Answer: A

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25. Which of the following is the strongest oxidising agent?

A. $BrO_3^- / Br^2, E^0 = +1.50$

B. $Fe^{3+} / Fe^{2+}, E^0 = +0.76$

C. $MnO_4^- / Mn^{2+}, E^0 = +1.52$

D. $Cr_2O_7^{2-} / Cr^{3+}, E^0 = +1.33$

Answer: C

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26. The equivalent weight of phosphoric acid (H_3PO_4) in the reaction $NaOH + H_3PO_4 \rightarrow NaH_2PO_4 + H_2O$ is

A. 25

B. 49

C. 59

D. 98

Answer: D

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27. Assertion: Fluorine exists only in -1 oxidation state.

Reason: Fluorine has $2s^2 2p^5$ configuration.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true and reason is not the correct explantion of the assertion.

C. If assertion is true but reason is false.

D. If the assertion false and reason is true.

Answer: B

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28. Assertion: $HClO_4$ is a stronger acid than $HClO_3$.

Reason: Oxidation state of Cl in $HClO_4$ is $+VII$ and in $HClO_3 + V$.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true and reason is not the correct explantion of the assertion.

C. If assertion is true but reason is false.

D. If the assertion false and reason is true.

Answer: B

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29. Assertion: Oxidation number of carbon in CH_2O is zero.

Reason: CH_2O formaldehyde, is a covalent compound.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true and reason is not the correct explantion of the assertion.

C. If assertion is true but reason is false.

D. If the assertion false and reason is true.

Answer: B

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