NEET CHEMISTRY PRACITCE PAPER

Time : 60 Mins **13 REDOX REACTION 1** **Marks : 200**

1. In an oxidation process for a cell, $M_1 \rightarrow M_1^{n+} + ne^-$, the other metal ($M_2$) being univalent showing reduction takes up ----- electrons to complete redox reaction.
   a) (n-1) b) 1 c) n d) 2
2. How many moles of electrons are involved in the reduction of one mole of MnO_4^- ion in alkaline medium to MnO_3^-?
   a) 2 b) 1 c) 3 d) 4
3. Phosphorus has the oxidation state of + 3 in
   a) Phosphorous acid b) Orthophosphoric acid c) Hypophosphorous acid d) Metaphosphoric acid
4. Arrange the following metals in which they displace each other from the solutions of their salts in decreasing order. Al, Cu, Fe, Mg and Zn.
   $[E^0_{Al^{3+}/Al} = -1.66V,\ E^0_{Cu^{2+}/Cu} = +0.34V,\ E^0_{Fe^{2+}/Fe} = -0.44V,\ E^0_{Mg^{2+}/Mg} = -2.36V,\ and\ E^0_{Zn^{2+}/Zn} = -0.76V]$
   a) Cu, Fe, Zn, Al, Mg b) Fe, Zn, Cu, Al, Mg c) Mg, Cu, Fe, Zn, Al d) Mg, Al, Zn, Fe, Cu
5. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
   Assertion: A metal having negative reduction potential when dipped in the solution of its own ions has a tendency to pass into solution.
   Reason: Metals undergo reduction.
   a) If both assertion and reason are true and reason is the correct explanation of assertion.
   b) If both assertion and reason are true but reason is not the correct explanation of assertion
   c) If assertion is true but reason is false. d) If both assertion and reason are false.
6. Carbon is in the lowest oxidation state in
   a) CH_4 b) CCl_4 c) CF_4 d) CO_2
7. Most stable oxidation state of gold is
   a) +1 b) +3 c) +2 d) +4
8. Which of the following halides is most easily oxidised?
   a) F^- b) Br^- c) I^- d) Cl^-
9. Write the stoichiometric coefficient for the following reaction:
   $xI_2 + yOH^- \rightarrow IO_3^- + zI^- + 3H_2O$

a)			b)			c)			d)		
x	y	z	x	y	z	x	y	z	x	y	z
6	3	5	3	2	3	3	6	5	3	3	3

10. Which of the following species has an atom with +6 oxidation state?
    a) MnO_4^- b) $Cr(CN)_6^{3-}$ c) NiF_6^{2-} d) CrO_2Cl_2
11. Mn^{3+} ions are unstable in solution and undergo disproportionation to give Mn^{2+}, MnO_2 and H^+ ions. What will be the balanced equation for the reaction?
    a) $3Mn^{3+} + 4H_2O \rightarrow MnO_2 + Mn^{2+} + 8H^+$ b) $Mn^{3+} + 4H_2O \rightarrow MnO_2 + 4H^+$
    c) $Mn + 2H_2O \rightarrow MnO_2 + 4H^+$ d) $2Mn^{3+} + 2H_2O \rightarrow MnO_2 + Mn^{2+} + 4H^+$
12. What is the correct representation of reaction occurring when HCl is heated with MnO_2?
    a) $MnO_4^- + 5Cl^- + 8H^+ \rightarrow Mn^{2+} + 5Cl^- + 5H_2O$ b) $MnO_2 + 2Cl^- + 4H^+ \rightarrow Mn^{2+} + Cl_2 + 2H_2O$
    c) $2MnO_2 + 4Cl^- + 8H^+ \rightarrow 2Mn^{2+} + 2Cl_2 + 4H_2O$ d) $MnO_2 + 4HCl \rightarrow MnCl_4 + Cl_2 + H_2O$
13. Which type of redox reaction is shown by the following reaction?
    0 +1-1 +1-1 0
    $Cl_{2(g)} + 2KBr_{(aq)} \rightarrow 2KCl_{(aq)} + Br_{2(l)}$
    a) Non-metal displacement reaction b) Disproportionation reaction
    c) sodium loses electrons and is oxidised while water is reduced
    d) water loses electrons and is oxidised to hydrogen.

14. Which of the following is the best description of the behaviour of bromine in the reaction given below?
$H_2O + Br_2 \longrightarrow HOBr + HBr$
a) Proton accepter only b) Both oxidized and reduced c) Oxidised only d) Reduces only

15. What mass of HNO_3 is needed to convert 5 g of iodine into iodic acid according to the reaction? (at mass of I = 127 u)
a) 12.4g b) 24.8g c) 0.24g d) 49.6g

16. In the conversion of Br_2 to BrO_3^-, the oxidation state of bromine changes from
a) 0 to + 5 b) -1 to + 5 c) 0 to - 3 d) + 2 to + 5

17. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion: All halogens undergo disproportionation reaction in alkaline medium.
Reason: All halogens exhibit variable oxidation states.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false d) If both assertion and reason are false.

18. Which of the following is true about the given redox reaction?
$SnCl_2 + 2FeCl_3 \rightarrow SnCl_4 + 2FeCl_2$
a) $SnCl_2$ is oxidised and $FeCl_3$ acts as oxidising agent. b) $FeCl_3$ is oxidised and acts as oxidising agent.
c) $SnCl_2$ is reduced and acts as oxidising agent. d) $FeCl_3$ is oxidised and $SnCl_2$ acts as a oxidising agent.

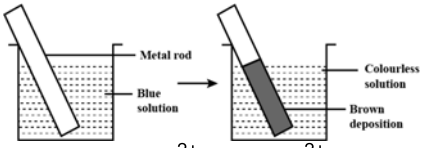
19. Which of the following are the common oxidising agents used in redox titrations?
a) $K_2Cr_2O_7$, $KMnO_4$, Iodine b) $FeSO_4$, $KMnO_4$, Sodium thiosulphate c) Oxalic acid, $KMnO_4$, $CuSO_4$
d) Mohr's salt, KI, Sodium sulphate

20. Mark the correct statement from the following:
a) Copper metal can be oxidised by Zn^{2+} ions. b) Oxidation number of phosphorus in P_4 is 4.
c) An element in the highest oxidation state acts only as a reducing agent.
d) The element which shows highest oxidation number of +8 is Os in OsO_4.

21. n-factor of H_3PO_2 during its diproportionation is $3H_3PO_2 \rightarrow PH_3 + 2H_3PO_3$
a) 1 b) 2 c) 4/3 d) 3/4

22. Oxidation numbers of $\mathrm{P\ in\ PO_4^{3-}},\ \mathrm{of\ S\ in\ SO_4^{2-}}$ and that of $= \mathrm{Cr\ in\ Cr_2O_7^{2-}}$ are respectively :
a) +3,+6 and +5 b) +5, +3 and +6 c) -3 ,+6 and +6 d) +5, +6 and +6

23. A redox reaction is shown in the diagrams. Identify the reaction.



a) $Zn_{(s)} + Cu_{(aq)}^{2+} \longrightarrow Zn_{(aq)}^{2+} Cu_{(s)}$ b) $Cu_{(s)} + 2Ag_{(aq)}^{+} \longrightarrow Cu_{(aq)}^{2+} + 2Ag_{(s)}$
c) $2Ag_{(s)} + Cu_{(aq)}^{2+} \longrightarrow 2Ag^{+}_{(aq)} + Cu_{(s)}$ d) $Cu_{(s)} + Zn^{2+}_{(aq)} \longrightarrow Cu^{2+}_{(aq)} + Zn_{(s)}$

24. Various oxidation states of few elements are mentioned. Which of the options is not correctly matched?
a) Phosphorus: +3 to +5 b) Nitrogen: +1 to +5 c) Iodine: -1 to +7 d) Chromium: -3 to +6

25. The equivalent mass of iron in Fe_2O_3 would be
a) 18.6 b) 28 c) 56 d) 11

26. Hot concentrated, sulphuric acid is a moderately strong oxidizing agent. Which of the following reactions do not show oxidizing behaviour?
a) $Cu + 2H_2SO_4 \longrightarrow CuSO_4 + SO_2 + 2H_2O$ b) $S + 2H_2SO_4 \longrightarrow 3SO_2 + 2H_2O$
c) $C + 2H_2SO_4 \longrightarrow CO_2 + 2SO_2 + 2H_2O$ d) $CaF_2 + H_2SO_4 \longrightarrow CaSO_4 + 2HF$

27. Oxidation number of Cr in CrO_5 is:
a) +5 b) -3 c) +6 d) +7

28. Equivalent weight of $Ba(MnO_4)_2$ in acidic medium (M = molar mass)
a) M b) M/3 c) M/5 d) M/10

29. In the reaction, $CH_3OH \rightarrow HCOOH$, the number of electrons that must be added to the right is:
a) 4 b) 3 c) 2 d) 1

30. $KMnO_4$ acts as an oxidising agent in alkaline medium, when alkaline $KMnO_4$ is treated with KI, iodine ion is oxidised to
    a) I_2 b) IO^- c) IO_3^- d) IO_4^-

31. In which of the following compounds oxidation state of chlorine has two different values?
    a) $CaCl_2$ b) NaCl c) $CaOCl_2$ d) CCl_4

32. A compound contains atoms of three-element A, B and C . If the oxidation number of A is +2. B is +5. and that of C is -2 the possible formula of the compound is
    a) $A(BC_3)_2$ b) $A_3(BC_4)_2$ c) $A_3(B_4C)_2$ d) ABC_2

33. Match the column I with column II with the type of reaction and mark the appropriate choice.

	Column I		Column II
(A)	$3MG_{(s)} + N_{2(g)} \xrightarrow{\Delta} Mg_3N_{2(s)}$	(i)	Displacement
(B)	$NaH_s + H_2O_{(l)} \rightarrow NaOH_{(aq)} + H_{2(g)}$	(ii)	Decomposition
(C)	$3CIO^-_{(aq)} \rightarrow 2Cl^-_{(aq)} + CIO_{3(aq)}$	(iii)	Combination
(D)	$2KCIO_{3(s)} \rightarrow 2KCl_s + 3O_{2(g)}$	(iv)	Disproportionation

    a) (A) → (i), (B) → (iii), (C) → (ii), (D) → (iv) b) (A) → (iv), (B) → (iii), (C) → (ii), (D) → (i)
    c) (A) → (ii), (B) → (i), (C) → (iii), (D) → (iv) d) (A)→ (iii), (B) → (i), (C) → (iv), (D) → (ii)

34. The eq.wt of iodine in, $I_2 + 2S_2O_3^{2-} \rightarrow 2I^- + S_4O_6^{2-}$ is equal to:
    a) mol.wt b) mol.wt/2 c) mol. wt/4 d) none of these

35. The standard E^0 values of few redox couples are Zn^{2+}/Zn = -0.76 V, Ag^+/Ag = + 0.80 V,Cu^{2+}/Cu = 0.34 V.Choose the correct option.
    a) Ag can oxidise Zn and Cu b) Ag can reduce Zn^{2+} and Cu^{2+}. c) Zn can reduce Ag^+ and Cu^{2+}.
    d) Cu can reduce Zn^{2+} and Ag^+.

36. What will be the products of electrolysis of $AgNO_3$ solution in water with platinum electrodes?
    a) Ag is liberated at cathode and Ag is deposited in anode
    b) Ag is liberated at cathode and O_2 is liberated at anode.
    c) Ag is liberated at anode and water is liberated at cathode.
    d) Ag is liberated at cathode and silver oxide is liberated at anode.

37. What will be the order of decreasing reducing nature for the given metals?
    a) Zn > Na > Fe > Mg > Cu > Ag b) Cu > Fe > Mg > Zn > Na > Ag c) Ag> Cu > Fe> Zn > Mg > Na
    d) Na> Mg > Zn > Fe > Cu > Ag

38. Given $E^0_{Ag^+/Ag} = +0.80V;\ E^0_{Cu^{2+}/Cu} = +0.34V;\ E^0_{Fe^{3+}/Fe^{2+}} = +0.76V;\ E^0_{Ce^{4+}/Ce^{3+}} = +1.60V$ Which of the following statements is not correct?
    a) Fe^{3+} does not oxidise Ce^{3+}. b) Cu reduces Ag^+ to Ag. c) Ag will reduce Cu^{2+} to Cu.
    d) Fe^{3+} reduces Cu^{2+} to Cu.

39. The E_0 values of redox complex of halogens are given. Based on these values mark the correct statement.
    $E^0_{I_2/I^-} = +0.54\ E^0_{Br_2/Br^-} = +1.08V,\ E^0_{Cl_2/Cl^-} = +1.36V,$
    a) Chlorine can displace bromine and iodine from their salt solutions.
    b) Chlorine can only displace iodine from its salt solution.
    c) Bromine can displace chlorine from its salt solution.
    d) Iodine can displace chlorine and bromine from their salt solutions.

40. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
    Assertion: In the reaction $2Cu_2O(s) + Cu_2S(s) \rightarrow 6Cu(s) + SO_{2(g)}$ copper acts as a reductant and sulphur acts as an oxidant.
    Reason: The given reaction is not a redox reaction.
    a) If both assertion and reason are true and reason is the correct explanation of assertion.
    b) If both assertion and reason are true but reason is not the correct explanation of assertion
    c) If assertion is true but reason is false d) If both assertion and reason are false.

41. A compound contains atoms X, Y and Z. The oxidation number of X is +2, Y is +5 and Z is -2.
    The possible formula of the compound is

a) XYZ_2 b) $Y_2(XZ_3)_2$ c) $X_3(YZ_4)_2$ d) $X_3(Y_4Z)_2$

42. The oxidation number of "V" in $Rb_4Na[HV_{10}O_{28}]$ is
a) +3 b) +5 c) +7 d) +6

43. What is the change in oxidation number of carbon in the following reaction?
$\mathrm{CH_4}(g) + 4\mathrm{Cl_2}(g) \rightarrow \mathrm{CCl_4}(1) + 4\mathrm{HCl}(g)$
a) 0 to -4 b) +4 to +4 c) 0 to +4 d) -4 to +4

44. The solution in a beaker turns blue if
a) Cu electrode is placed in $ZnSO_4$ solution b) Cu electrode is placed in $AgNO_3$ solution
c) Cu electrode is placed in $Al_2(SO_4)_3$ solution d) Cu electrode is placed in $FeSO_4$ solution

45. The brown ring complex, $[Fe(H_2O)_5NO^+]\ SO_4$ has oxidation number of Fe as :
a) +1 b) +2 c) +3 d) zero

46. Which of the following acts as a self-indicator?
a) $K_2Cr_2O_7$ b) $KMnO_4$ c) Oxalic acid d) Iodine

47. The oxidation number of chromium in potassium dichromate is:
a) +6 b) -5 c) -2 d) +2

48. Fluorine is best oxidising agent because
a) it is most electronegative. b) it has highest reduction potential. c) it has highest oxidation potential.
d) it has smallest size.

49. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion: Conversion of potassium ferrocyanide to potassium ferricyanide is an oxidation process.
Reason: Oxidation is the addition of oxygen/ electronegative element to a substance or removal of hydrogen/electropositive element from a substance.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false

50. $3Fe + 4H_2O \rightarrow Fe_3O_4 + 4H_2$. If the atomic mass of iron is 56. then its equivalent mass will be :
a) 42 b) 21 c) 63 d) 84