



## CHEMISTRY

### BOOKS - MODERN PUBLICATION CHEMISTRY (KANNADA ENGLISH)

### REDOX REACTIONS

#### Multiple Choice Questions Level I

1. Which of the following statement is incorrect ?

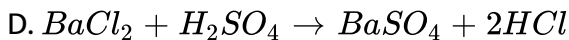
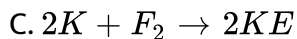
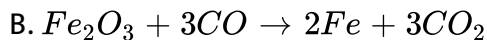
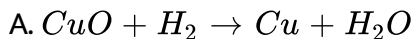
- A. Oxidation is loss of electrons or increase in oxidation number.
- B. A substance which decreases the oxidation number of other substance in a chemical reaction is a reducing agent.
- C. Oxidising agent is a substance whose oxidation number increases.

D. Reducing agent is a substance which can give one or more electrons.

**Answer: C**

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2. One of the following is not an example for a redox reaction , it is :



**Answer: D**

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3. The oxidation number of an element in a compound is evaluated on the basis of certain rules. Which of the following rules is not correct in this respect?

- A. 1. The oxidation number of hydrogen is always +1.
- B. 2. The algebraic sum of all the oxidation numbers in a compound is zero.
- C. 3. An element in the free or the uncombined state bears oxidation number zero.
- D. 4. In all its compounds, the oxidation number of fluorine is -1.

**Answer: A**



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4. Oxidation number of P in  $PO_4^{3-}$  ion is :

- A. -3

B. +7

C. +5

D. +3.

**Answer: C**



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5. Assign the oxidation number of Mn in  $MnO_4^-$

A. +1

B. -7

C. -1

D. +7.

**Answer: D**



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6. The element with atomic number 9 can exhibit oxidation state of :

A. +1

B. +3

C. -1

D. +5

**Answer: C**

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7. Oxidation number of solution in sodium amalgam (Na/Hg) is

A. 0

B. +1

C. -1

D. +2

**Answer: A**

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8. Oxidation number of oxygen in  $F_2O$  and  $H_2O_2$  is respectively.

A.  $-2$  and  $+2$

B.  $+2$  and  $-1$

C.  $-2$  in both

D.  $+2$  and  $-2$

**Answer: B**

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9. Oxidation number of chromium in  $K_2Cr_2O_7$  is

A.  $-2$

B. +3

C. +6

D. 0

**Answer: C**



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10. Oxidation number of Fe in  $Fe_3O_4$  is :

A. +2

B. +3

C. +2.66

D. +4.

**Answer: A**



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11. Oxidation number of xenon in all the compounds

$XeO_2F_2$ ,  $XeF_6$ ,  $XeO_3$  and  $XeOF_4$  is :

A. +6

B. 0

C. +2

D. not the same in all .

**Answer: D**



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12. Oxidation of oxygen atom in potassium super oxide is :

A. 0

B. -1

C. -2

D. -1/2



**Answer: A**

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**13.** The oxidation number of nitrogen in hydroxyl - amine is :

A.  $-1$

B.  $0$

C.  $-2$

D.  $-3$ .

**Answer: D**

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**14.** The oxidation number of nitrogen in  $NH_3$  is :

A.  $-1$

B. +3

C. -3

D. +1/3

**Answer: B**



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15. The oxidation number of boron in  $Na_2B_4O_7$  is :

A. +2

B. +3

C. +4

D. +1

**Answer: B**



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16. Calculate the oxidation number of Pb in  $Pb_3O_4$

A.  $+\frac{4}{3}$

B.  $+4$

C.  $+\frac{8}{3}$

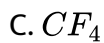
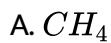
D.  $+2$ .

**Answer: C**



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17. Carbon is in the lowest oxidation state in



**Answer: C**

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**18.** Oxidation state of oxygen atom in sodium peroxide is :

- A.  $-1$
- B.  $-2$
- C.  $0$
- D.  $-1/2$

**Answer: B**

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**19.** What is the oxidation state of S in  $Na_2S_2$ ?

- A.  $+1$

B.  $-2$

C.  $-1$

D.  $0$

**Answer: C**

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20. The oxidation state of S in Caro's acid (permono sulphuric acid)

$H_2SO_5$  is

A.  $+8$

B.  $+6$

C.  $+5$

D.  $+4$

**Answer: B**

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21. The oxidation state of S in  $[S_2(O_2)O_6]^{2-}$  is

A. +2

B. +4

C. +6

D. +7

**Answer: C**



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22. In which of the following S has highest oxidation state?

A.  $Na_2S_4O_6$

B.  $S_2Cl_2$

C.  $S_8$

D.  $H_2SO_4$

**Answer: D**

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**23.** Which of the following statement is not correct ?

- A. Oxidants is a substance which increases the oxidation number of other substance.
- B. Reducant is a substance which decreases the oxidation number of other substance.
- C. The oxidation number of oxidant decreases.
- D. In oxidation there is decreases in oxidation number.

**Answer: D**

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**24.** The oxidation state of Cr in  $Cr(CO)_6$  is

A. 0

B. +2

C. -2

D. +6.

**Answer: A**



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**25.** What is the oxidation state of oxygen in peroxide i.e.  $H_2O_2$ ?

A. -1

B. +2

C. -2

D. +1.

**Answer: A**



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26. The oxidation state of phosphorus in  $Ba(H_2PO_2)_2$  is

A. +3

B. +2

C. +1

D. -1

**Answer: C**



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27. What is the oxidation number of carbonyl carbon in methanal ?

A. +3

B. +2

C. +4

D. 0

**Answer: D**

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28. In the reaction ,  $Zn(s) + PbCl_2(aq) \rightarrow Pb(s) + ZnCl_2(aq)$  the reducing agent is

A. Pb (s)

B.  $PbCl_2(aq)$

C. Zn (s)

D.  $ZnCl_2(aq)$ .

**Answer: C**

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29. In the reaction :  $Cl_2 + 2OH^- \rightarrow OCl^- + Cl^- + H_2O$

- A.  $OH^-$  is oxidising and  $Cl^-$  is reducing agent
- B.  $Cl_2$  is oxidising and  $OH^-$  is reducing agent
- C.  $OH^-$  is both oxidising and reducing agent
- D.  $Cl_2$  is both oxidising and reducing agent.

Answer: D



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30. In the reaction :  $3CuO + 2NH_3 \rightarrow N_2 + 3H_2O + 3Cu$  the change of  $NH_3$  to  $N_2$  involve

- A. Loss of 6 electrons per mol of  $N_2$
- B. Loss of 3 electrons per mol  $N_2$
- C. Gain of 6 electrons per mol of  $N_2$
- D. Gain of 3 electrons per mol of  $N_2$

**Answer: A**

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**31.** Oxidation number of Fe in  $Fe_3O_4$  is :

A. +2

B. +3

C. +8/3

D. +2/3

**Answer: C**

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**32.** When phosphorus reacts with caustic soda , the products are  $PH_3$  and  $NaH_2PO_2$ . The reaction is an example of

- A. oxidation
- B. reduction
- C. disproportionation
- D. none of these.

**Answer: D**

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**33. Identify disproportionation reaction :**

- A.  $CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$
- B.  $CH_4 + 4Cl_2 \rightarrow CCl_4 + 4HCl$
- C.  $2F_2 + 2OH^- \rightarrow 2F^- + OF_2 + H_2O$
- D.  $2NO_2 + 2OH^- \rightarrow NO_2^- + NO_3^- + H_2O$

**Answer: D**

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34. Which of the following elements does not show disproportionation tendency ?

A. Cl

B. Br

C. F

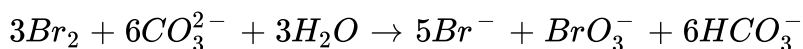
D. I

Answer: C



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35. In the reaction :



A.  $Br_2$  is oxidised and carbonate is reduced.

B. Bromine is reduced and water is oxidised.

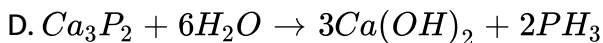
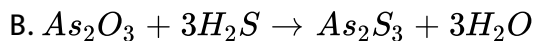
C. Bromine is neither reduced nor oxidised

D. Bromine is both reduced and oxidised.

**Answer: D**

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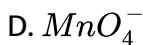
**36.** Which one of the following reactions involves disproportionation ?



**Answer: C**

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37. Which of the following species can function both as oxidizing as well as reducing agent ?

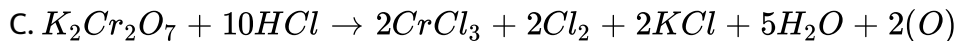


Answer: C



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38. Balance the following equation by oxidation number method.  $K_2Cr_2O_7 + HCl \rightarrow KCl + CrCl_3 + H_2O + Cl_2$ .







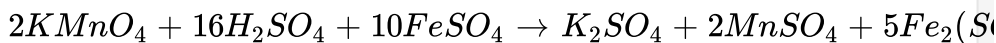
Answer: D



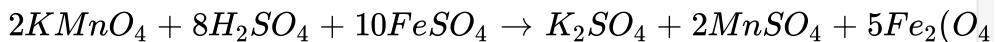
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39. The balanced chemical equation for the reaction of potassium permanganate and sulphuric acid with ferrous sulphate to produce ferric sulphate, potassium sulphate, manganese sulphate and water is :

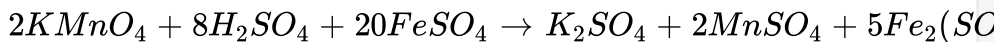
A.



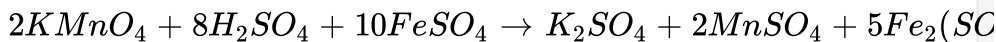
B.



C.



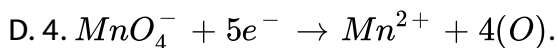
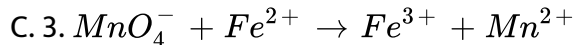
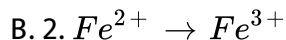
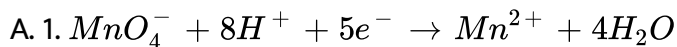
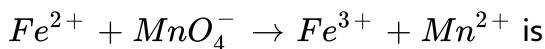
D.



**Answer: D**

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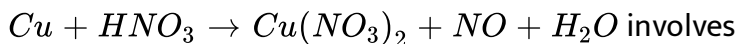
**40.** Reduction half reaction for the reaction :



**Answer: A**

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**41.** The balance chemical equation for the reaction

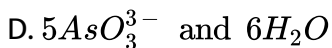
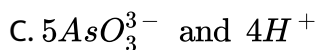
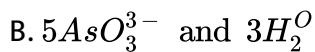
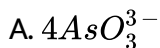
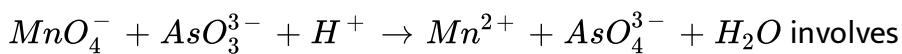




**Answer: D**

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**42.** The balanced chemical equation for the reaction :



**Answer: B**

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43. In the ionic equation -  $BiO_3^- + 6H^+ + Xe^- \rightarrow Bi^{3+} + 3H_2O$  the values of x is

A. 3

B. 4

C. 6

D. 2

**Answer: D**

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44. In the ionic equation for the reaction :

$IO_3^- + 6H^+ + ae^- \rightarrow I^- + 3H_2O$  the value of a is :

A. 2

B. 4

C. 6

D. 10

**Answer: C**

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45. Equivalent weight of  $\text{Cr}_2\text{O}_7^{2-}$  (mol. wt. =  $M$ ) in the following reaction is :  $\text{Cr}_2\text{O}_7^{2-} + 6\text{I}^- + 14\text{H}^+ \rightarrow 2\text{Cr}^{3+} + 3\text{I}_2 + 7\text{H}_2\text{O}$

A.  $M$

B.  $M/2$

C.  $M/6$

D.  $M/14$ .

**Answer: C**

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46. In the reaction of oxidation of thiosulphate (mol . Mass =112)

$2S_2O_3^{2-} \rightarrow S_4O_6^{2-} + 2e^-$  equivalent weight of thiosulphate ion is :

A. 56

B. 112

C. 224

D. 28

**Answer: B**

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47. In the reduction of  $KMnO_4$  (molar mass = 158) in the presence of dil .

Sulphuric acid to manganese salt , the equivalent weight of  $KMnO_4$  is :

A. 158

B. 790

C. 31.6

D. 79

**Answer: C**

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**48.** In the reaction  $Fe_2O_3 + 3C \rightarrow 2Fe + 3CO$ , oxidation number of C

A. increases by 3 per atom

B. decreases by 3 per atom

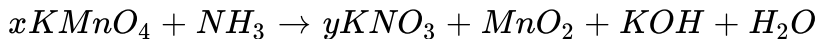
C. increases by 2 per atom

D. no change.

**Answer: C**

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49. In the redox reaction



A.  $x=4$  ,  $y=6$

B.  $x=8$ ,  $y=6$

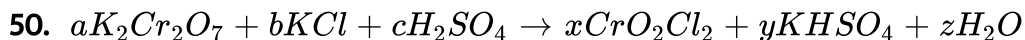
C.  $x=3$ ,  $y=8$

D.  $x=8$ ,  $y=3$

**Answer: D**



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The above equation balances when

A.  $a = 2$ ,  $b = 4$ ,  $c = 6$  and  $x = 2$ ,  $y = 6$ ,  $z = 3$

B.  $a = 4$ ,  $b = 2$ ,  $c = 6$  and  $x = 6$ ,  $y = 2$ ,  $z = 3$

C.  $a = 6$ ,  $b = 4$ ,  $c = 2$  and  $x = 6$ ,  $y = 3$ ,  $z = 2$

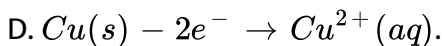
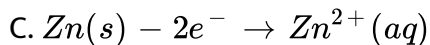
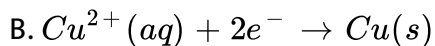
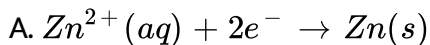
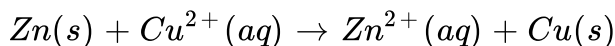


D.  $a = 1, b = 4, c = 6$  and  $x = 2, y = 6, z = 3$

**Answer: D**

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51. Which of the following reactions occurs at anode in the electrochemical cell reaction ?

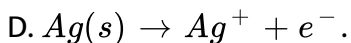
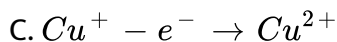
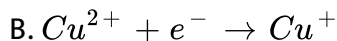
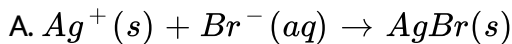


**Answer: C**

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52. In the cell reaction :

$Ag(s) + Cu^{2+}(aq) + Br^{-}(aq) \rightarrow AgBr(s) + Cu^{+}(aq)$  the reduction half reaction is :



**Answer: B**



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53. The standard electrode potential of  $Zn^{2+}|Zn$  and  $Cu^{2+}|Cu$  are -0.76 and 0.34 V respectively . The standard e.m.f. of the cell is :

A. 0.42 V

B. - 1.10V

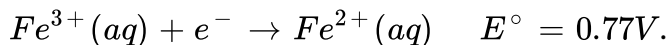
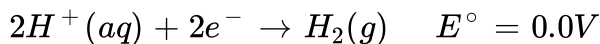
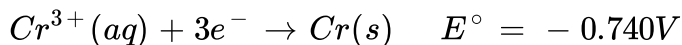
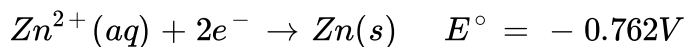
C. Zero

D. 1.10V.

**Answer: D**

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**54.** The standard reduction potential at 298 K for the following half cell reactions are given below

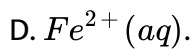


Which is the strongest reducing agent ?

A. Zn (s)

B. Cr(s)

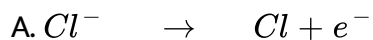
C.  $\text{H}_2(\text{g})$



**Answer: A**

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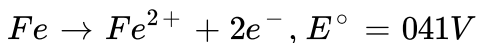
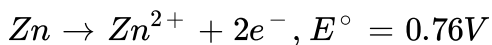
55. Which of the following is not anodic reaction in an electrochemical series ?



**Answer: C**

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56. The standard electrode potentials  $E^\circ$  for the half cell reactions are as :



The EMF of the cell reaction  $\text{Fe}^{2+} + \text{Zn} \rightarrow \text{Zn}^{2+} + \text{Fe}$  is :

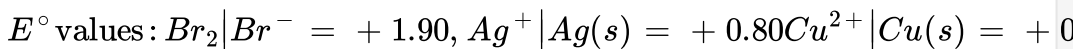
- A.  $-0.35\text{V}$
- B.  $+0.35\text{V}$
- C.  $+1.17\text{V}$
- D.  $-1.17\text{V}$ .

**Answer: B**



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57.  $E^\circ$  values of some redox couples are given below On the basis of these values choose the correct option.



A. Cu will reduce  $Br^-$

B. Cu will reduce Ag

C. Cu will reduce  $I^-$

D. Cu will reduce  $Br_2$

**Answer: D**

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**58.** On the basis of standard electrode potential of redox couples given below find out which of the following is the strongest oxidising agent.

$E^\circ$  values,  $Fe^{3+} | Fe^{2+} = +0.77$ ,  $I_2(s) | I^- = +0.54$ ,  $Cu^{2+} | Cu = +0.34$

A.  $Fe^{3+}$

B.  $I_2(s)$

C.  $Cu^{2+}$

D.  $Ag^+$

**Answer: D**

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**59.** The increasing electron releasing tendencies of Cu , Ag , Fe and Zn are in the order :

A. Ag , Cu , Fe , Zn

B. Cu , Ag , Fe , Zn

C. An , Cu , Fe , Ag

D. Fe , Zn , Cu , Ag

**Answer: A**

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**60.** The following four colourless salt solutions are placed in separate test tubes and a strip of a copper is placed in each Which of the following

solutions will finally turn blue ?

A.  $NaCl$

B.  $AgNO_3$

C.  $ZnSO_4$

D.  $Cd(NO_3)_2$ .

**Answer: B**



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61. When Zn is added to  $CuSO_4$  solution , copper is precipitated because of :

A. reduction of Zn

B. hydrolysis of  $CuSO_4$

C. oxidation of Zn

D. reduction of  $SO_4^{2-}$  ions.



**Answer: C**

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**62.** In a galvanic cell , which of the following statements is correct ?

- A. 1. anode is negatively charged
- B. 2. cathode is positively charged
- C. 3. reduction occurs at anode
- D. 4. standard e.m.f of the cells is always zero.

**Answer: C**

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**63.** The standard reduction potential values of the three metallic cations X,Y and Z are 0.52, -3.03 and -1.18 V respectively . The order of reducing power of the corresponding metal is ?

A.  $Y > Z > X$

B.  $X > Y > Z$

C.  $Z > Y > X$

D.  $Z > X > Y$

**Answer: A**



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**64.** In a standard hydrogen electrode , the concentration of  $H^+$  is :

A. 0.1 M

B. 1 M

C. 10 M

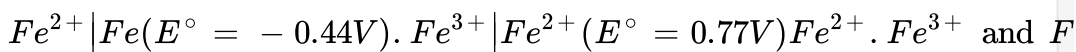
D. Not fixed.

**Answer: B**



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65. Standard electrode potentials are :



blocks are kept together , then

- A.  $Fe^{3+}$  increases
- B.  $Fe^{3+}$  decreases
- C.  $Fe^{2+} / Fe^{3+}$  remains unchanged
- D.  $Fe^{2+}$  decreases

**Answer: A**



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66. A gas at 1 atm is bubbled through a solution containing  $1M Y^-$  and  $1M Z^-$  at  $25^\circ C$ . If the reduction potential of  $Z > Y > Z$ , then

- A. Y will oxidize X and not Z
- B. Y will oxidise Z and not X
- C. Y will oxidize both x and Z
- D. Y will reduce both X and Z.

**Answer: C**

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67. Standard electrode potential of three metals X , Y and Z are - 1.2 V, +0.5 V and - 3.0 V respectively . The reducing power of these metals will be

- A.  $Y > Z > X$
- B.  $Y > X > Z$
- C.  $Z > X > Y$
- D.  $X > Y > Z$

**Answer: C**

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68. 1 M solution each of  $Cu(NO_3)_2$ ,  $AgNO_3$ ,  $Hg_2(NO_3)_2$  and  $Mg(NO_3)_2$  is electrolysed using Pt-electrodes. The values of standard electrode potentials in volts are :  
 $Ag^+ / Ag = + 0.80V$ ,  $Cu^{2+} / Cu = + 0.34V$ ,  $Hg_2^{2+} / Hg = + 0.79V$ ,  $Mg^{2+} / Mg = - 2.37V$

The sequence of deposition of metals on the cathode will be

A.  $Mg, Ag, Cu$

B.  $Mg, Cu, Ag$

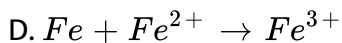
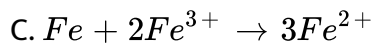
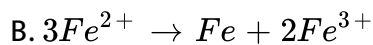
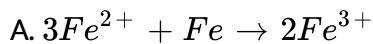
C.  $Ag, Hg, Cu$

D.  $Cu, Hg, Ag$

Answer: C

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69. For the galvanic cell  $Pt(s) | Fe^{2+}, Fe^{3+} || Fe^{2+} | Fe$  cell reaction is

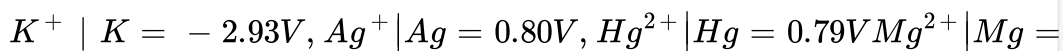


Answer: B



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70. Given the standard electrode potentials



The metal having highest reducing power is

A. K

B. Ag

C. Cr

D. Mg

**Answer: A**

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## Multiple Choice Questions Level II

1. Oxidation number of sulphur in  $SO$ ,  $SO_2$ ,  $SOCl_2$  and  $Na_2S_4O_6$  is respectively.

A. +2, +4, +6, +5

B. +2 in all compounds

C. +2, +4, +4, +3

D. +2, +4, +4, +2.5

**Answer: D**

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2. Oxidation number of chlorine in  $Cl_2O$ ,  $Cl_2$  and  $ClO_3^-$  is respectively.

A. +1, -1, +5

B. +1, 0, -1

C. -1, 0, -1

D. +1, 0 + 5.

**Answer: D**



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3. The brown ring complex compound is formulated as

$[Fe(H_2O)_5NO]SO_4$ . The oxidation state of iron is :

A. +1

B. +2

C. +3

D. 0



**Answer: B**

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4. Oxidation number of C in  $CH_3OH$ ,  $CH_2O$ ,  $COOH$  and  $C_2H_2$  is respectively :

A.  $-2, 0, +2, -1$

B.  $+2, 0, +2, -2$

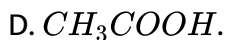
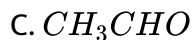
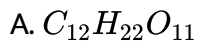
C.  $-2, 0, +2, 0$

D.  $-2, -4, +2, -2$

**Answer: A**

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5. In which of the following compounds , the oxidation number of carbon is not zero ?



**Answer: C**

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6. The oxidation states of V and Br in  $V(BrO_2)_2$  are respectively

A. 2 and 2

B. 2 and 1

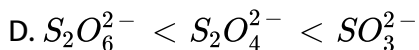
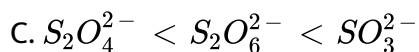
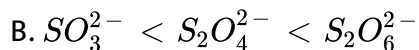
C. 4 and 2

D. 2 and 3.

**Answer: D**

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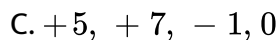
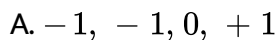
7. The oxidation states of sulphur in the anions  $SO_3^{2-}$ ,  $S_2O_4^{2-}$  and  $S_2O_6^{2-}$  follow the order :



**Answer: A**

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8. Oxidation number of iodine in  $IO_3$ ,  $IO_4$ ,  $KI$  and  $I_2$  respectively are

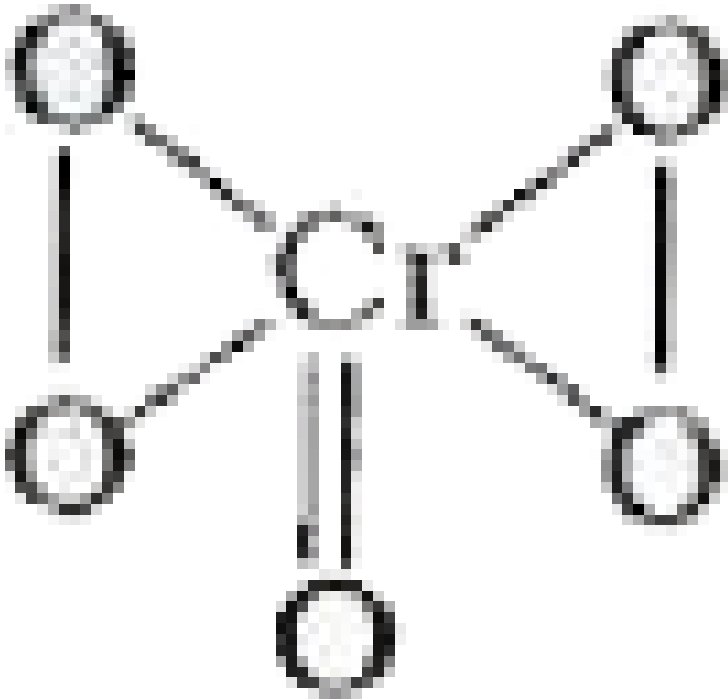


D.  $-1, -5, -1, 0$

Answer: C

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9. Oxidation state of chromium in



A.  $+10$

B. +6

C. +3

D. +2

**Answer: B**



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10. Using the standard electrode potential, find out the pair between which redox reaction is not feasible.

$E^{\circ}$  values:  $Fe^{3+} | Fe^{2+} = + 0.77$ ,  $I_2 | I^{-} = + 0.54$ ,  $Cu^{2+} | Cu = + 0.34$ ,

A.  $Fe^{3+}$  and  $I^{-}$

B.  $Ag^{+}$  and  $Cu$

C.  $Fe^{3+}$  and  $Cu$

D.  $Ag$  and  $Fe^{3+}$

**Answer: D**

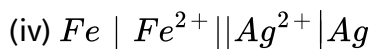
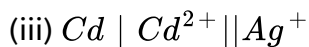
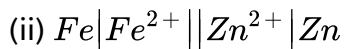
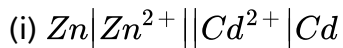


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11. The standard electrode potentials of some electrodes are :

Electrode	$Zn^{2+} Zn$	$Cd^{2+} Cd$	$Ag^+ Ag$	$Fe^{2+} Fe$
$E^\circ (V)$	-0.76	-0.40	0.80V	-0.44V

Which of the following cells are feasible and give their  $E^\circ$  cell ?



A. (i) , (iii) , (iv)

B. (i) , (iii)

C. (ii)

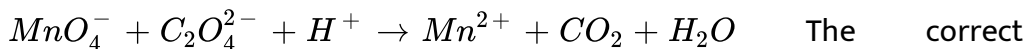
D. (ii) , (iv)

**Answer: A**

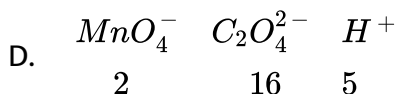
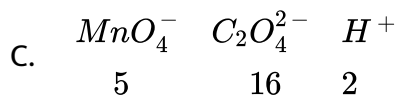
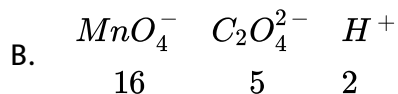
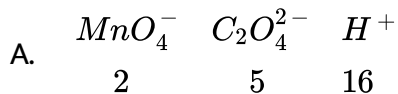


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12. For the redox reaction :



coefficients of the reactants in the balanced equation are :



Answer: A

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13. The oxidation number of S in  $\text{S}_8$ ,  $\text{S}_2\text{F}_2$  and  $\text{H}_2\text{S}$  respectively are :

A. 0, + 1, - 2

B. +2, + 1, - 2

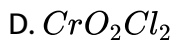
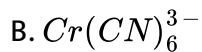
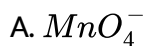
C. 0, + 1, + 2

D. +2, +1, -2

**Answer: A**

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14. Amongst the following identify the species with an atom with +6 oxidation state



**Answer: D**

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15. In the electrolytic cell , flow of electrons is from

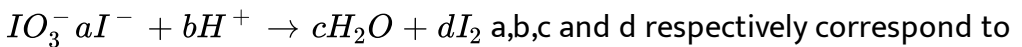
- A. cathode to anode in solution
- B. cathode to anode through external supply
- C. cathode to anode through internal supply
- D. anode to cathode through internal supply.

**Answer: C**



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16. In the balance chemical equation :



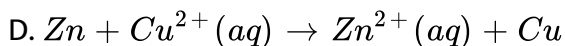
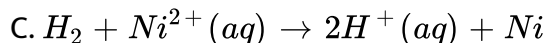
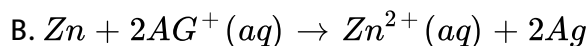
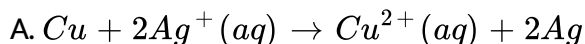
- A. 5,6,3,3
- B. 5,3,6,3
- C. 3,5,3,6
- D. 5,6,5,5

**Answer: A**



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17. The standard oxidation potentials of Zn, Cu, Ag and Ni electrodes are +0.76,-0.34,-0.80 and +0.25 V respectively . Which of the following reaction will provide maximum voltage ?



**Answer: B**



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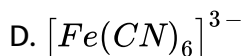
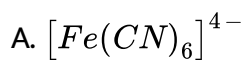
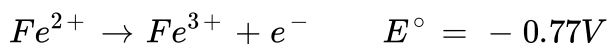
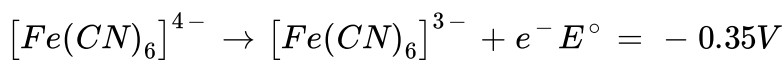
18. The electrochemical cell stops working after sometime because

- A. Electrode potential of both the electrodes becomes zero
- B. Electrode potential of both the electrodes becomes equal
- C. One of the electrodes is eaten away
- D. The cell reaction gets reversed

**Answer: B**

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**19.** On the basis of following  $E^\circ$  values , the strongest oxidising agent is



**Answer: C**

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**20.** The oxidation number of sulphur atoms in peroxomonosulphuric acid ( $H_2SO_5$ ) and peroxodi - sulphuric acid ( $H_2S_2O_8$ ) are respectively

- A. +8 and +7
- B. +3 and +3
- C. +6 and +6
- D. +4 and +4

**Answer: C**

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**21.** Oxidation number of P in  $PO_4^{3-}$ , S in  $SO_4^{2-}$  and that of Cr in  $Cr_2O_7^{2-}$  are respectively

A. +3, +6 and +5

B. -3, +6 and +6

C. +5, +3 and +6

D. +5, +6 and +6

**Answer: D**

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

A.  $N_2H_4$

B.  $NH_3$

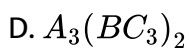
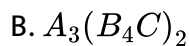
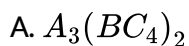
C.  $N_3H$

D.  $NH_2OH$

**Answer: C**

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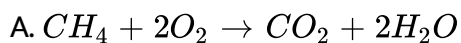
23. A compound contains atoms of three elements A,B and C. If the oxidation number of A is +2 , B is +5 and that of C is -2 , then the possible formula of the compound is

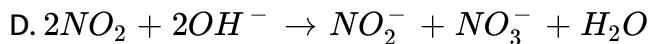
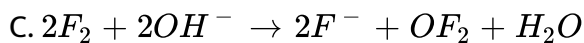
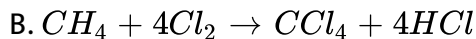


**Answer: A**

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24. Identify disproportionation reaction :





**Answer: D**

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25. When  $KMnO_4$  acts as an oxidising agent and ultimately forms  $MnO_4^{2-}$ ,  $MnO_2O_3$  and  $Mn^{2+}$ , then the number of electrons transferred in each case is

A. 4,3,1,5

B. 1,5,3,7

C. 1,3,4,5

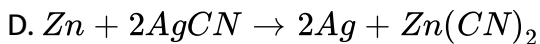
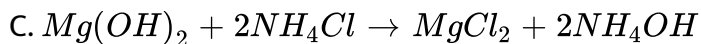
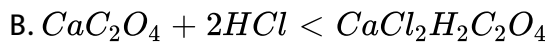
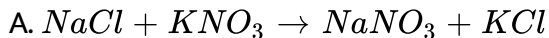
D. 3,5,7,1

**Answer: C**



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26. Which of the following is a redox reaction ?



Answer: D



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27. In the standardization of  $Na_2S_2O_3$  using  $K_2Cr_2O_7$  by iodometry, the equivalent weight of  $K_2Cr_2O_7$  is

A. Molecular weight /2

B. Molecular weight /6



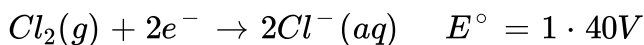
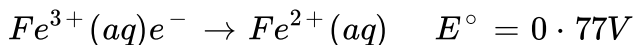
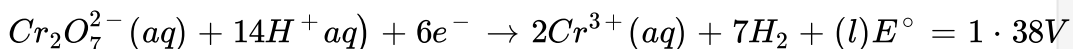
C. Molecular weight /3

D. Same as molecular weigh

**Answer: B**

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**28.** Standard electrode potential data are useful for understanding the stability of an oxidant in a redox titration . Some half reactions and their standard potentials are given below :



Identify the only incorrect statement regarding the quantitative estimation of aqueous  $Fe(NO_3)_2$ .

A.  $MnO_4^-$  can be used in aqueous HCl

B.  $Cr_2O_7^{2-}$  can be used in aqueous HCl

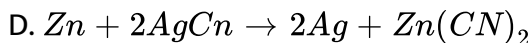
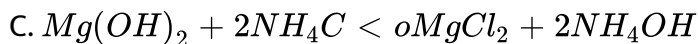
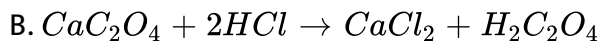
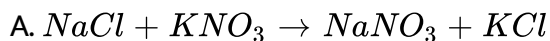
C.  $MnO_4^-$  can be used in aqueous  $H_2SO_4$

D.  $Cr_2O_7^{2-}$  can be used in aqueous  $H_2SO_4$

**Answer: A**

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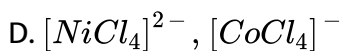
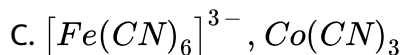
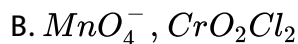
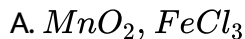
29. Which of the following is a redox reaction ?



**Answer: D**

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30. The pairs of compounds having metals in their highest oxidation state is



Answer: B



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31. Consider the following  $E^\circ$  values  
 $E^\circ (Fe^{3+} | Fe^{2+}) = + 0.77V, E^\circ (Sn^{2+} | Sn) = - 0.14V$  under  
standard conditions , the potential for the reaction :  
 $Sn(s) + 2Fe^{3+}(aq) \rightarrow 2Fe^{2+}(aq) + Sn^{2+}(aq)$  is

A. 0.19 V

B. 0.140 V

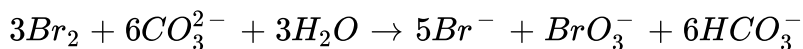
C. 1.68 V

D. 0.63 V

**Answer: A**

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32. In the reaction :



A. Bromine is oxidised and carbonate is reduced

B. Bromine is neither oxidised nor reduced

C. Bromine is oxidised and water is reduced

D. Bromine is both reduced and oxidised.

**Answer: A**

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33. Consider a titration of potassium dichromate solution with acidified Mohr's salt solution using diphenylamine as indicator . The number of moles of Mohr 's salt required per mole of dichromate

A. 3

B. 4

C. 5

D. 6

**Answer: D**



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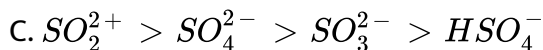
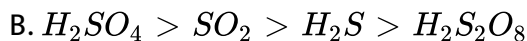
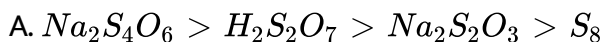
34. Amount of oxalic acid present in a solution can be determined by its titration with  $KMnO_4$  solution in the presence of  $H_2SO_4$  . The titration gives unsatisfactory results when carried out in the presence of HCl because HCl

- A. oxidises oxalic acid to carbon dioxide and water
- B. gets oxidised by oxalic acid to chlorine
- C. furnishes  $H^+$  ions in addition to those from oxalic acid.
- D. reduces permanganate to  $Mn^{2+}$

**Answer: D**

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**35.** Which of the following have been arranged in decreasing order of oxidation number of sulphur ?



**Answer: D**

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## Multiple Choice Questions Level Iii

1. Consider the following reaction :



The values of x,y and z in the reaction are , respectively :

A. 5 , 2 and 16

B. 2 , 5 and 8

C. 2 , 5 and 16

D. 5 , 2 and 8.

**Answer: B**

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2. Given  $E_{Cr^{3+}/Cr}^{\circ} = -0.74V$ ,  $E_{MnO_4^-/Mn^{2+}}^{\circ} = 1.51V$

$E_{Cr_2O_7^{2-}/Cr^{3+}}^{\circ} = 1.33V$ ,  $E_{Cl/Cl^-}^{\circ} = 1.36V$  Based on the data given

above, strongest oxidising agent will be :

A.  $Cl^-$

B.  $Cr^{3+}$

C.  $Mn^{2+}$

D.  $MnO_4^-$

**Answer: D**



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## Recent Examination Questions

1. When sulphur dioxide is passed in an acidified  $K_2Cr_2O_7$  solution, the oxidation state of sulphur is changed from



A.  $+4 \rightarrow +6$

B.  $+6 \rightarrow +4$

C.  $+4 \rightarrow 0$

D.  $+4 \rightarrow +2$ .

**Answer: A**

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2. Hydrogen gas is not liberated when the following metal added to dil HCl

A. Mg

B. Sn

C. Ag

D. Zn.

**Answer: C**

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3. In chromite are , the oxidation number of iron and chromium respectively .....

A. +3, + 2

B. +3, + 6

C. +2, + 6

D. +2, + 3.

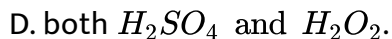
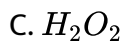
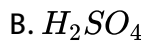
**Answer: D**

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4. In the reaction,  $2FeSO_4 + H_2SO_4 + H_2O_2 \rightarrow Fe_2(SO_4)_3 + 2H_2O$ .

The oxidizing agent is :

A.  $FeSO_4$



**Answer: C**

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5.  $Pb_3O_4 + 4HNO_3 \rightarrow 2Pb(NO_3)_2 + PbO_2 + 2H_2O$  Which is true about the lead ions in  $Pb_3O_4$  ?

A.  $Pb^{2+}$  reacts with  $HNO_3$  to give lead nitrate

B.  $Pb^{4+}$  reacts with  $HNO_3$  to give lead nitrate

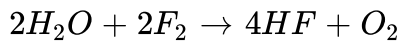
C.  $Pb^{2+}$  reacts with  $HNO_3$  to give  $PbO_2$

D.  $Pb^{4+}$  reacts with  $HNO_3$  to give  $PbO_2$ .

**Answer: A**

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6. Choose the correct statements applicable for the reaction :



- A. Water is oxidized to  $O_2$
- B.  $F_2$  is oxidized to HF
- C. Water is reduced to HF
- D.  $F_2$  acts as reducing agent in the reaction.

**Answer: A**



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