165.(D) Let oxidation states of phosphorous in H_3PO_2, H_3PO_4, H_3PO_3 and $H_4P_2O_6$ be p, q r and s respectively.

Oxidation state of hydrogen $= +1$

Oxidation state of oxygen $= -2$

Thus, in H_3PO_2 : $3\times(+1)+p+2\times(-2)=0$ $\therefore$ $p=+1$

In H_3PO_4 : $3\times(+1)+q+4\times(-2)=0$ $\therefore$ $q=+5$

In H_3PO_3 : $3\times(+1)+r+3\times(-2)=0$ $\therefore$ $r=+3$

In $H_4P_2O_6$: $4\times(+1)+2s+6\times(-2)=0$ $\therefore$ $s=+4$

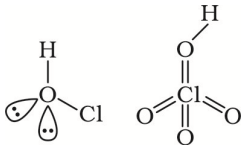
Thus, the order of oxidation state is : $H_2PO_4 > H_4P_2O_6 > H_3PO_3 > H_3PO_2$

166.(BC) Energy, $E=\dfrac{hc}{\lambda}$

The colour of the X_2 molecule of group 17 elements changes gradually from yellow to violet down the group. This is because the amount of energy required for the excitation of the halogen atom decreases down the group from F_2 to I_2.

$HOMO(\pi^*)-LUMO(\sigma^*)$ gas decreases down the group that makes π^* to σ^* excitation easier. Lesser the energy gap, more is the wavelength of light absorbed and hence, lesser is the wavelength of light emitted.

167.(ABD) Structures of $HOCl$ and $HClO_4$ are :



(A) $HClO_4$ is a stronger acid than H_3O^+. Therefore, conjugate base of $HClO_4$. i.e., ClO_4^-, is weaker base than H_2O.

(B) The hybridisation of central atom in both $HClO$ and $HClO_4$ is sp^3.

(C) Reaction of Cl_2 with water forms $HOCl$ which decomposes to give nascent oxygen.

$Cl_2+H_2O\rightarrow[HCl+HOCl]\rightarrow HOCl\rightarrow HCl+[O]$

(D) $HClO_4$ is more acidic than $HClO$ as ClO_4^- is more stable than ClO^- due to resonance.

168.(A) $\underset{\substack{\text{Potassium}\\\text{chloride}}}{2KClO_3} \xrightarrow[\Delta]{MnO_2} \underset{\substack{\text{Potassium}\\\text{chloride}}}{2KCl} + \underset{\substack{\text{Oxygen}\\(W)}}{3O_2}$

$\underset{\substack{(\text{Excess})\\(W)}}{O_2(g)} + \underset{\substack{\text{White}\\\text{phosphorus}}}{P_4(s)} \longrightarrow \underset{\substack{\text{Phosphorus}\\\text{pentoxide}\\(X)}}{P_4O_{10}(s)}$

$\underset{(X)}{P_4O_{10}} + \underset{(\text{Pure})}{4HNO_3} \longrightarrow \underset{\substack{\text{Dinitrogen}\\\text{pentoxide}\\(Y)}}{2N_2O_5} + \underset{\substack{\text{Meta-phosphoric}\\\text{acid}\\(Z)}}{4HPO_3}$

169.(B) W : O_2 ; X : P_4O_{10}

170.(BC) Ammonium nitrate decomposes below 300°C to produce N_2O and H_2O.

$NH_4NO_3\longrightarrow N_2O+2H_2O$

On further heating i.e., above 300°C.

$2NH_4NO_3 \xrightarrow{\Delta} 2N_2 + O_2 + 4H_2O$

Ammonium dichromate on heating below 300°C decomposes to give N_2 and C(III) oxide.

$(NH_4)_2Cr_2O_7 \xrightarrow{\Delta} N_2 + Cr_2O_3 + 4H_2O$

Barium azide on heating around 180°C decomposes to give N_2 gas and Ba.

$Ba(N_3)_2 \longrightarrow 3N_2 + Ba$

Magnesium nitride decomposes above 700°C to give Mg and N_2 gas.

$Mg_3N_2 \longrightarrow 3Mg + N_2$

So, on heating below 300°C only $(NH_4)_2Cr_2O_7$ and $Ba(N_3)_2$ produce N_2 gas.

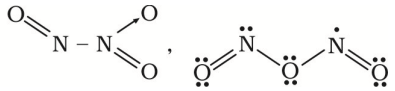
171.(ABC) **(A)** Basic character of oxide increases as we move down the group. Therefore, Bi_2O_5 is more basic than N_2O_5.

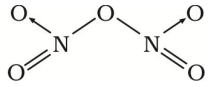
(B) Covalent nature depends on the electronegativity difference between the bonded atoms. Therefore, NF_3 is more covalent than BiF_3.

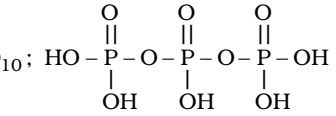
(C) Due to H-bonding, boiling point of NH_3 is more than PH_3.

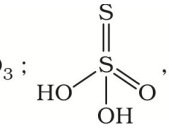
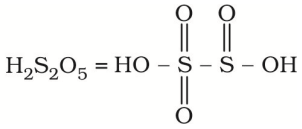
(D) Due to small size on N-atom, *l.p – l.p.* repulsion will be more in N – N single bond than in P – P single bond. Therefore, N – N single bond is weaker than P – P single bond.

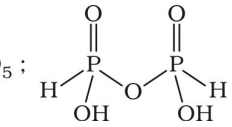
172.(5 or 6)

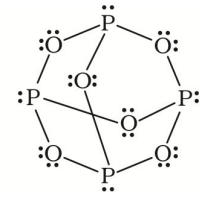
N_2O_3 ; 

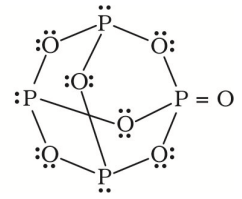
N_2O_5 ; 

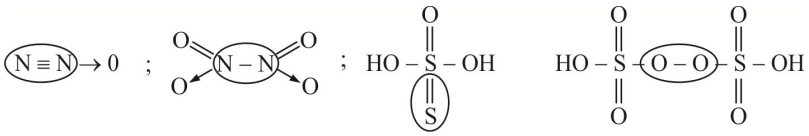
$H_5P_3O_{10}$; 

$H_2S_2O_3$;  , $H_2S_2O_5$ = 

$H_4P_2O_5$; 

P_4O_6 ; 

P_4O_7 ; 

173.(4) 

174.(19) $XeF_4 + O_2F_2 \longrightarrow XeF_6 + O_2$