

**CHEMISTRY****Redox Reactions****Oxidation Number**

11. (A)

(i) Oxidation state of element in its free state is zero.

(ii) Sum of oxidation states of all atoms in compound is zero.

O.N. of S is  $S_8 = 0$ O.N. of S in  $S_2F_2 = +1$ O.N. of S in  $H_2S = -2$ 

12. (C)

 $CaOCl_2$  or  $Ca(OCl)Cl$  is the mixed salt of  $Ca(OH)_2$  with  $HCl$  and  $HOCl$ .

13. (A)

Let the oxidation state of S be x

$$S_4O_6^{2-} \Rightarrow 4x - 12 = -2$$

$$\Rightarrow 4x = 10 \Rightarrow x = \frac{10}{4} = 2.5$$

14. (4)

O.N. of Fe in (a), (b), (c) and (d) respectively are +3, +2, +2 and 0.

15. (1)

Oxidation number of Cr on both side is +6.

16. (2)

In  $KMnO_4$ 

Let O.N. of Mn be x

$$\Rightarrow +1 + x + 4(-2) = 0 \Rightarrow x = +7$$

In  $K_2Cr_2O_7$ 

Let O.N. of Cr be x

$$\Rightarrow 2(1) + 2x + 7(-2) = 0 \Rightarrow x = +6$$

17. (A)

$$\underline{Cu}O = +2$$

$$\underline{Mn}O_2 = +4$$

$$H\underline{Au}Cl_4 = +3$$

$$\underline{Tl}_2O = +1$$

18. (3)

Calculating the oxidation state of nitrogen in given molecules

Oxidation state of N in  $NH_3$  is

$$x + 3(+1) = 0 \text{ or } x = -3$$

Oxidation state of N in  $NaNO_3$  is

$$1 + x + 3(-2) = 0 \text{ or } x = +5$$

Oxidation state of N in  $NaN_3$  is

$$+3 + 3x = 0 \text{ or } x = -\frac{1}{3}$$

Oxidation state of N in  $Mg_3N_2$  is

$$3 \times 2 + 2x = 0 \text{ or } x = -3$$

Thus, 3 molecules (i.e.,  $NH_3$ ,  $NaN_3$  and  $Mg_3N_2$ ) have nitrogen in negative oxidation state.

19. (2)

$HClO_4$  is stronger acid than  $HClO_3$  because the anion formed,  $ClO_4^-$  is more stabilized due to 4 oxygen (electronegative) atoms than  $ClO_3^-$  which has 3 oxygen atoms. Negative charge is more delocalised in  $ClO_4^-$ .

20. (4)

 $CrO_2Cl_2$ Cr in  $CrO_2Cl_2$  is +3, +4, +6

The species with an atom in +6

Oxidation state  $CrO_2Cl_2$