UNIT TEST-03

Subject : Chemistry
Class : XI

Q.1 (4)	**Q.2** (4)	**Q.3** (4)	**Q.4** (1)	**Q.5** (3)	**Q.6** (1)	**Q.7** (2)	**Q.8** (2)	**Q.9** (1)	**Q.10** (2)
Q.11 (1)	**Q.12** (3)	**Q.13** (2)	**Q.14** (2)	**Q.15** (2)	**Q.16** (4)	**Q.17** (1)	**Q.18** (1)	**Q.19** (3)	**Q.20** (2)
Q.21 (2)	**Q.22** (1)	**Q.23** (3)	**Q.24** (1)	**Q.25** (4)	**Q.26** (2)	**Q.27** (4)	**Q.28** (3)	**Q.29** (3)	**Q.30** (1)
Q.31 (2)	**Q.32** (2)	**Q.33** (2)	**Q.34** (2)	**Q.35** (1)	**Q.36** (1)	**Q.37** (3)	**Q.38** (1)	**Q.39** (4)	**Q.40** (1)
Q.41 (4)	**Q.42** (1)	**Q.43** (4)	**Q.44** (1)	**Q.45** (3)	**Q.46** (4)	**Q.47** (4)	**Q.48** (3)	**Q.49** (2)	**Q.50** (4)

Q.1 (4)
According to law of mass action, at a given temperature the rate of reaction at a particular instant is proportional to the product of active masses of the reactants at that instant raised to powers which are numerically equal to the numbers of their respective molecules.

Q.2 (4)

$$N_2 + 3H_2 \rightleftharpoons 2NH_3$$

	N_2	$3H_2$	$2NH_3$
t = 0	1 mol	3 mol	0
t = eq	1 – 0.5	3 – 1.5	1

$$P_{N_2} = X_{N_2} \times P_T = \frac{0.5}{3} \times P = \frac{P}{6}$$

Q.3 (4)

For the reaction $N_{2(g)} + O_{2(g)} \rightleftharpoons 2NO_{(g)}$

$\Delta n_g = 0$
$K_p = K_c = 0.1$.

Q.4 (1)

Q.5 (3)
If Q < K_c, it famours forward reaction.

Q.6 (1)

Q.7 (2)

$$PCl_5(g) \rightleftharpoons PCl_3(g) + Cl_2(g)$$

	$PCl_5(g)$	$PCl_3(g)$	$Cl_2(g)$
t = 0	5	0	0
t = eq	5 – x	x	x

$x = 60\%$ of $5 = 0.6 \times 5 = 3$
moles of $PCl_5 = 5 - x = 5 - 3 = 2$
moles of PCl_3 = moles of $Cl_2 = x = 3$
Total moles = 2 + 3 + 3 = 8.

Q.8 (2)

Q.9 (1)

$$PCl_5 \rightleftharpoons PCl_3 + Cl_2$$

$$K_p = \frac{Px^2}{1-x^2}$$

$$\frac{P_1x_1^2}{1-x_1^2} = \frac{P_2x_2^2}{1-x_2^2}$$

$$\frac{2\times(0.40)^2}{\left[1-(0.40)^2\right]} = \frac{P_2(0.80)^2}{\left[1-(0.80)^2\right]} \quad \therefore\ P_2 = 0.2 \text{ atm}$$

Q.10 (2)

$N_2 + 3H_2 \rightleftharpoons 2NH_3; \Delta H = -ve$
high P & low T favour forward reaction
$2SO_2(g) + O_2(g) \rightarrow 2SO_3(g), \Delta H = -ve$
high P & low T
$N_2 + O_2 \rightleftharpoons NO; \Delta H = +ve$
No effect of pressure,
favours by high temperature
$PCl_3 + Cl_2 \rightarrow PCl_5,\ \Delta H = +ve$
high P & high temperature

Q.11 (1)

Q.12 (3)

Q.13 (2)
Those substance accept the proton are called Bronsted base and which is donate the proton are called Bronsted acid.

$HCO_3^- + H^+ \rightleftharpoons H_2CO_3$ Bronsted base.

$HCO_3^- \rightleftharpoons H^+ + CO_3^{--}$ Bronsted acid.

Q.14 (2)
BF_3 is Lewis acid (e^-pair acceptor)

Q.15 (2)
For pure water $[H^+] = [OH^-]$, $\therefore K_w = 10^{-12}$ s

Q.16 (4)

K_w increases with increase in temperature

Q.17 (1)

$$K = \frac{\alpha^2 C}{1-\alpha};\ \alpha = \frac{0.01}{100} \approx 1\ \therefore K = \alpha^2 C = \left[\frac{0.01}{100}\right]^2 \times 1$$

$$= 1 \times 10^{-8}$$

Q.18 (1)

Q.19 (3)

Decinormal solution = $\frac{1}{10}$N

$\alpha = 20\,\% = 0.2$

$[OH]^- = C\alpha$

$$= \frac{1}{10} \times 0.2 = 2 \times 10^{-2}$$

So pOH = $2 - \log_{10} 2$

= 1.7

pH = 14 – 1.7

= 12.3

Q.20 (2)

Q.21 (2)

Q.22 (1)

Q.23 (3)

Q.24 (1)

Q.25 (4)

Q.26 (2)

Q.27 (4)

Q.28 (3)

Q.29 (3)

∵ In this reaction phosphorus is simultaneously oxidised and reduced.

∴ It is disproportionation reation.

$$\overset{0}{P_4} + 3NaOH + 3H_2O \rightarrow 3NaH_2\overset{+}{P}O_2 + \overset{3}{P}H_3$$

Q.30 (1)

$$\text{Eq.ut} = \frac{\text{Atomic weight}}{\text{Valency tactor}} = \frac{32}{2} = 16$$

Q.31 (2)

Q.32 (2)

100 ml mixture

$NaOH + Na_2SO_4$

eq. of H_2SO_4 = eq. of NaOH

0.5 x 10 x 2 = M × v × n-factor

10 = M × 100 × 1

$\boxed{M = 0.1}$

moles = 0.1 × 0.1

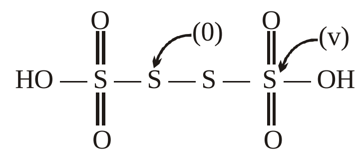
= 0.01

mass = .01 × 40

$\boxed{\text{mass} = 0.4 \text{ gm}}$

Q.33 (2)

$Na_2S_4O_6$ is salt of $H_2S_4O_6$ which has the following structure



⇒ Difference in oxidation number of two types of sulphur = 5

Q.34 (2)

Q.35 (1)

Q.36 (1)

$2SO_2(g) + O_2(g) \rightleftharpoons 2SO_3(g)$ is an example of homogeneous equilibrium.

Q.37 (3)

fact based

Q.38 (1)

Q.39 (4)

Equilibrium constant donot depend on concentration of reactants

Q.40 (1)

Q.41 (4)

Q.42 (1)

Q.43 (4)

Q.44 (1)

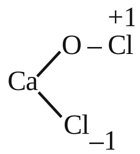
$$Ag_2CrO_4 \rightleftharpoons \underset{2S}{2Ag^+} + \underset{S}{CrO_4^{-2}}$$

$K_{sp} = [2S]^2[S]$

$$S^3 = \frac{K_{sp}}{4} = \frac{1.1 \times 10^{-12}}{4}$$

$S = 6.43 \times 10^{-5}$

Q.45 (3)



Bleaching powder

$\therefore$ Average oxidation state = $\frac{+1-1}{2}$ =0

Q.46 (4)

Double displacement reaction is normally not a redox reaction, So when we mix $AgNO_3$ with NaCl the product AgCl & H_2O is formed which has the same oxidation number.

Q.47 (4)

	$BaCl_2$	+ $Al_2(SO_4)_3$	$\rightarrow BaSO_4$	+ $AlCl_3$
Initial meq.	30×0.2	40×0.3	0	0
	= 6	= 12	0	0
After rexmeq.	6 – 6	12–6	6	6

So meq.of $BaSO_4$ = 6

& Eq. of $BaSO_4$ = 6×10^{-3}

$$\left[\text{eq.wt} = \frac{233}{2}\right] \text{ \& Eq.} = \frac{\text{Wt.}}{\text{eq.Wt.}}$$

$$= 6 \times 10^{-3} = \frac{\text{Wt.} \times 2}{233}$$

Q.48 (3)

Q.49 (2)

$$\overset{+3}{NO_2^-} + H_2O \longrightarrow \overset{+5}{NO_3^-} + 2H^+ + 2e^-$$

n = 2.

Q.50 (4)

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