

# UNIT TEST-01

Subject : Chemistry

Class : XII

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

- Q.1** (1)  
Orthophosphoric acid ( $H_3PO_4$ ) is a tribasic acid.  
 $\therefore$  Normality = molarity  $\times$  basicity  
 $\therefore$  Normality =  $3M \times 3 = 9N$
- Q.2** (1)  
Molarity of pure water =  $\frac{1000}{18} = 55.6 M$ .
- Q.3** (3)  
 $= 40 + 120 = 160$   
 $P_A = y_A \cdot P = y_A \times 160$   
 $\Rightarrow 40 = y_A \times 160 \quad \Rightarrow y_A = \frac{1}{4}$
- Q.4** (1)  
When a saturated solution of KCl is heated then solvent ( $H_2O$ ) becomes evaporated now it lefts only KCl i.e. solution becomes unsaturated.
- Q.5** (3)  
 $\frac{P^\circ - P_s}{P_s} = \frac{WM}{m \times w}$   
Given  $m = 40$   
 $w = 114 g$   
 $M_{\text{octane}} = 114$   
 $\therefore \frac{100 - 80}{80} = \frac{w \times 114}{40 \times 114}$   
[ $w = 10 g$ ]
- Q.6** (1)
- Q.7** (2)  
Henry's constant is greater for gases with lower solubility.
- Q.8** (1)  
 $P = P_B^\circ X_B + P_T^\circ X_T$   
 $120 = 150(X_B) + 50(1 - X_B)$   
 $100 X_B = 70$   
 $X_B = 0.7$   
 $Y_B = \frac{X_B P_B^\circ}{P} = \frac{0.7 \times 150}{120} = 0.875$   
 $Y_T = \frac{P - P_B}{P} = \frac{120 - 100}{120} = 0.167$   
 $Y_B = 0.875$   
 $Y_T = 0.125$

- Q.9** (4)  
A solution which cannot be separated to its constituent by fractional distillation is Minimum & Maximum boiling azeotropes.
- Q.10** (1)  
Ideal solution  $\Delta H = 0$   
 $\Delta V = 0$   
 $F_{A-A} = F_{B-B} = F_{A-B}$
- Q.11** (3)  
Raoult's law.
- Q.12** (2)
- Q.13** (2)  
Elevation in boiling point is colligative property and depends upon number of ions of molecules or particles.  
 $CaSO_4 \rightarrow Ca^{2+} + SO_4^{2-} \quad \therefore 2 \text{ ions}$   
 $BaCl_2 \rightarrow Ba^{2+} + 2Cl^- \quad \therefore 3 \text{ ions}$   
 $NaCl \rightarrow Na^+ + Cl^- \quad \therefore 2 \text{ ions}$   
urea  $\rightarrow$  no dissociation  $\therefore 1 \text{ molecule}$   
 $\therefore BaCl_2$  furnishes maximum ions.  
 $\therefore BaCl_2$  will have maximum boiling point.
- Q.14** (2)  
 $\Delta T_f = K_f m$   
 $= \frac{1.86 \times 45 \times 1000}{6 \times 600} = 2.2$   
Freezing point of solution =  $273.15 K - 2.2 K$   
 $= 270.95 K$
- Q.15** (1)  
Osmotic pressure :-  
 $\pi = i \times C \times R \times T$   
 $\pi \propto i \times C$
- Q.16** (2)
- Q.17** (1)  
For  $K_4[Fe(CN)_6]$   
 $i = 5$   
 $Al_2(SO_4)_3 \rightarrow 2Al^{3+} + 3SO_4^{2-}$   
 $i = 5$

**Q.18** (4)van't Hoff factor for association (i) =  $1 - \alpha + \frac{\alpha}{n}$ Given  $\alpha = 1$  and  $n = 3$ 

$$\therefore i = 2.74$$

$$\text{So } \alpha = \frac{2.74 - 1}{3 - 1} = \frac{1.74}{2} = 0.87$$

$$= 0.87 \times 100 = 87\%$$

**Q.19** (3) $E_{\text{cell}}^0 < 0$  then cell will not work $\Delta G^0 > 0$  ( $\therefore \Delta G^0 = -nF E_{\text{cell}}^0$ ) In this case also cell will not work $K_{\text{eq}} < 1$  ( $\therefore \Delta G^0 = -RT \ln K$ ) In this case also cell will not work**Q.20** (1)**Q.21** (2)

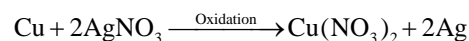
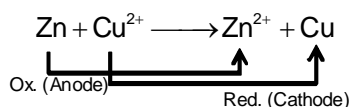
All are the function of salt bridge

**Q.22** (4)**Q.23** (1)

Lower S.R.P, more reduction power

**Q.24** (1)

Cu is placed above Ag in electrochemical series, hence it can replace Ag from its salts solution. Therefore, the reaction occur as follows

**Q.25** (4)So,  $E_{\text{cell}}^0 = E_{\text{Cathode}} - E_{\text{anode}}$  (S.R.P.)

$$= +0.34 - (-0.76)$$

$$= +1.1 \text{ V}$$

**Q.26** (2)

The oxidation potential

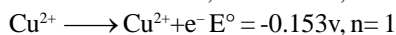
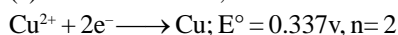
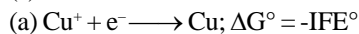
 $\propto \frac{1}{\text{Concentration of ions}}$  and reductionPotential  $\propto$  concentration of ions. The cell voltage can be increased by decreasing the concentration of ions around anode or by increasing the concentration of ions around cathode**Q.27** (4)

$$E_{\text{Zn/Zn}^{2+}}^0 = 0.76 \text{ V} \quad \therefore E_{\text{Zn}^{2+}/\text{Zn}}^0 = -0.76 \text{ V}$$

$$E_{\text{Fe}^{2+}/\text{Fe}}^0 = -0.41 \text{ V}$$

So hence Zn electrode will act as Anode &amp; Fe electrode will act as cathode

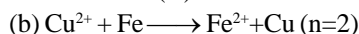
$$E_{\text{cell}}^0 = E_{\text{c}}^0 - E_{\text{A}}^0 = -0.41 + 0.76 = 0.35$$

**Q.28** (2)**Q.29** (2)

$$E^0 \text{ of } \text{Cu}^+ + e^- \longrightarrow \text{Cu} = \frac{2 \times 0.337 - 0.153 \times 1}{1}$$

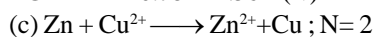
$$E^0 = 0.521 \text{ v}$$

$$\Delta G^0 = -0.521 F(\text{iii})$$



$$E_{\text{Cu}^{2+}/\text{Cu}}^0 - E_{\text{Fe}^{2+}/\text{Fe}}^0 = 0.34 - (-0.44) = 0.78 \text{ V}$$

$$\Delta G^0 = 2 \times F \times 0.78 = -1.56 F(\text{iv})$$



$$E^0 = E_{\text{Cu}^{2+}/\text{Cu}}^0 - E_{\text{Zn}^{2+}/\text{Zn}}^0 = 0.34 - (-0.76)$$

$$E^0 = 1.1 \text{ V}$$

$$\Delta G^0 = -2 \times F \times 1.1 = -2.2 F(\text{ii})$$



$$\Delta G = -0.80 F(\text{ii})$$

**Q.30** (2)

If F is Faraday and N is Avogadro number, charge of

$$\text{electron} = \frac{F}{N}$$

**Q.31** (1)Power =  $v \times i$ 

$$i = \frac{100}{110} = 0.909 \text{ amp, } t = 10 \text{ hr}$$

$$= 10 \times 60 \times 60$$

$$= 36000 \text{ sec}$$

$$Q = i \times t = 0.909 \times 36000$$

$$= 32724 \text{ coulomb}$$

$$w = \frac{E_w}{96500} \times Q = \frac{112.4}{2 \times 96500} \times 32724 = 19.05 \text{ g}$$

**Q.32** (1)**Q.33** (2)

An electrolytic cell

- Q.34** (4)
- Q.35** (4)  
fact
- Q.36** (3)  
Concentration (ppm) =  $\frac{0.2}{500} \times 10^6 = 400$
- Q.37** (1)  
One molar (1 M) aqueous solution is more concentrated than one molal aqueous solution of the same solute.  
NaCl = 2 ions  
H<sub>2</sub>SO<sub>4</sub> = 3 ions  
Hence number of ions for NaCl solution is less so it provide more vapour pressure
- Q.38** (3)  
AgCl → Ag<sup>+</sup> + Cl<sup>-</sup>  
S S  
K<sub>sp</sub> = S<sup>2</sup> = (1 × 10<sup>-5</sup>)<sup>2</sup> = 1 × 10<sup>-10</sup> mol L<sup>-1</sup>  
Solubility in 0.05 NaCl ⇒ [Cl<sup>-</sup>] = 0.05 M  
K<sub>sp</sub> of AgCl = [Ag<sup>+</sup>][Cl<sup>-</sup>]  
1 × 10<sup>-10</sup> = S[0.05]  
S =  $\frac{1 \times 10^{-10}}{0.05} = 2 \times 10^{-9}$  M
- Q.39** (1)  
According to Raoult's law  
p = p<sub>A</sub><sup>o</sup>X<sub>A</sub> + p<sub>B</sub><sup>o</sup>X<sub>B</sub>  
290 = 200 × 0.4 + p<sub>B</sub><sup>o</sup> × 0.6  
p<sub>B</sub><sup>o</sup> = 350
- Q.40** (3)  
Solute-Solvent interactions > Solute-solute or solvent-solvent interaction ↓  
interactions are high  
So, bonds cannot easily break that's why vapours decreases So, V.P. decreases negative deviation.
- Q.41** (2)  
Colligative property in decreasing order  
Na<sub>3</sub>PO<sub>4</sub> > Na<sub>2</sub>SO<sub>4</sub> > NaCl  
Na<sub>3</sub>PO<sub>4</sub> → 3Na<sup>+</sup> + PO<sub>4</sub><sup>3-</sup> = 4  
Na<sub>2</sub>SO<sub>4</sub> → 2Na<sup>+</sup> + SO<sub>4</sub><sup>2-</sup> = 3  
NaCl → Na<sup>+</sup> + Cl<sup>-</sup> = 2
- Q.42** (3)  
Osmosis is a process in which solvent (water in this case) flows from low conc<sup>n</sup> sol<sup>n</sup> to high concentration through SPM.
- Q.43** (4)  
HA = H<sup>+</sup> + A<sup>-</sup>  
(1 - α) α α  
PH = 2 = [H<sup>+</sup>] : 10<sup>-2</sup> = C<sup>2</sup>  
α = 0.1  
i = 1 + α = 1 + 0.1 = 1.01
- Q.44** (4)  
Cu can't displace Al<sup>3+</sup> ion from aluminium nitrate.
- Q.45** (1)  
More negative E<sup>o</sup> value more will be reducing power.  
So reducing power order-  
A > B > C
- Q.46** (3)  
-ΔG = 2.303 RT log K
- Q.47** (3)  
In this Cl<sup>-</sup> will oxidise to give Cl<sub>2</sub> Na<sup>+</sup> water reduction potential has higher potential than that of water reduction potential, so water will reduce to give H<sub>2</sub>.
- Q.48** (2)  
Mole deposited in increasing proportional to ualency factor  
 $1 : 1 \times \frac{1}{2} : \times \frac{1}{3}$
- Q.49** (3)  
Lead storage battery is a secondary cell and (3) option reaction is of lead storage battery anode reaction.
- Q.50** (2)  
 $\Lambda_{m[K_2SO_4]}^o = 2\lambda_{mK^+}^o + 1\lambda_{mSO_4^{2-}}^o$   
∴ So Correct Ans. (2)