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 × basicity
$\therefore$ Normality = 3M × 3 = 9N

Q.2 (1)
Molarity of pure water $= \frac{1000}{18} = 55.6\,M$.

Q.3 (3)
$= 40 + 120 = 160$
$P_A = y_A{}^{\circ}P = y_A \times 160$
$\Rightarrow 40 = y_A \times 160 \qquad \Rightarrow y_A = ¼$

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 $m = 40$
$w = 114\ g$
$M_{octane} = 114$
$$\therefore \frac{100-80}{80} = \frac{w \times 114}{40 \times 114}$$
[w = 10 g]

Q.6 (1)

Q.7 (2)
Henergy's constant is greater for gases with lower solubility.

Q.8 (1)
$P = P_B{}^{\circ}X_B + P_T{}^{\circ}X_T$
$120 = 150(X_B) + 50(1 - X_B)$
$100 \qquad X_B = 70$
$X_B = 0.7$
$$Y_B = \frac{X_B P_B^0}{P} = \frac{0.7 \times 150}{120} = 0.075 \qquad \frac{Y_B}{Y_T} = \frac{7}{1} Y_T$$
$= 1 - 0.875 = 0.125$

Q.9 (4)
A solution which cannot be separated to its consituent by fractional distilation 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 ions
$BaCl_2 \rightarrow Ba^{2+} + 2Cl^- \quad \therefore$ 3 ions
$NaCl \rightarrow Na^+ + Cl^- \quad \therefore$ 2 ions
urea $\rightarrow$ no dissociation $\therefore$ 1 molecule
$\because$ $BaCl_2$ 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 $K_4[Fe(CN)_6]$
$\boxed{i = 5}$
$Al_2(SO_4)_3 \rightarrow 2Al^{+3} + 3SO_4^{2-}$
$\boxed{i = 5}$

Q.18 (4)

van't Hoff factor for association (i) $= 1 - \alpha + \frac{\alpha}{n}$

Given $\alpha = 1$ and $n = 3$

$\because i = 2.74$

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

$= 0.87 \times 100 = 87\%$

Q.19 (3)

$E^0_{cell} < 0$ then cell will not work

$\Delta G^0 > 0$ ($\therefore \Delta G^0 = -nf\ E^0_{cell}$) In this case also cell will not work

$K_{eq} < 1$ ($\therefore \Delta G^0 = -RT \ln K$) 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

$$Cu + 2AgNO_3 \xrightarrow{\text{Oxidation}} Cu(NO_3)_2 + 2Ag$$

Q.25 (4)

$$Zn + Cu^{2+} \longrightarrow Zn^{2+} + Cu$$

Ox. (Anode) Red. (Cathode)

So, $E^o_{cell} = E_{Cathode} - E_{anode}$ (S.R.P.)

$= +0.34 - (-0.76)$

$= +1.1$ V

Q.26 (2)

The oxidation potential

$\propto \frac{1}{Concentration \text{ of ions}}$ and reduction

Potential $\propto$ 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)

$E^o_{Zn/Z_n^{+2}} = 0.76$ V $\quad \therefore \quad E^o_{Zn^{+2}/Zn} = -0.76$ V

$E^o_{Fe^{2+}/Fe} = -0.41$ V

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

$E^o_{cell} = E^0_c - E^0_A = -0.41 + 0.76 = 0.35$

Q.28 (2)

Q.29 (2)

(a) $Cu^+ + e^- \longrightarrow Cu$; $\Delta G° = -IFE°$

$Cu^{2+} + 2e^- \longrightarrow Cu$; $E° = 0.337$v, n= 2

$Cu^{2+} \longrightarrow Cu^{2+} + e^-$ $E° = -0.153$v, n= 1

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

$E° = 0.521$ v

$\Delta G° = -0.521$ F(iii)

(b) $Cu^{2+} + Fe \longrightarrow Fe^{2+} + Cu$ (n=2)

$E°_{Cu\frac{2+}{cu}} - E°_{Fe\frac{2+}{Fe}} = 0.34 - (-0.44) = 0.78$V

$\Delta G° = 2 \times Fx\ 0.78 = -1.56$ F (iv)

(c) $Zn + Cu^{2+} \longrightarrow Zn^{2+} + Cu$; N= 2

$E° = E°_{Cu\frac{2+}{cu}} - E°_{Zn\frac{2+}{Zn}} = 0.34 - (-0.76)$

$E° = 1.1$V

$\Delta G° = -2 \times Fx1.1 = -2.2$F (ii)

(d) $Ag^+ + e^- \longrightarrow Ag$, $E° = 0.80$, n= 1

$\Delta G = -0.80$ F (ii)

Q.30 (2)

If F is Faraday and N is Avogadro number, charge of electron $= \frac{F}{N}$

Q.31 (1)

Power = v x i

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

$= 10 \times 60 \times 60$

$= 36000$ sec

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

$= 32724$ coulomb

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

Q.32 (1)

Q.33 (2)

An electrolytic cell

Q.34 (4)

Q.35 (4)
fact

Q.36 (3)

$$\text{Concentration (ppm)} = \frac{0.2}{500} \times 10^6 = 400$$

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_2SO_4 = 3 ions
Hence number of ions for NaCl solution is less so it provide more vapour pressure

Q.38 (3)

$$AgCl \rightarrow Ag^+ + Cl^-$$
$$S \quad S$$

$K_{sp} = S^2 = (1 \times 10^{-5})^2 = 1 \times 10^{-10} \text{mol L}^{-1}$
Solubility in 0.05 NaCl $\Rightarrow [Cl^-] = 0.05$ M
K_{sp} of AgCl = $[Ag^+][Cl^-]$
$1 \times 10^{-10} = S[0.05]$

$$S = \frac{1 \times 10^{-10}}{0.05} = 2 \times 10^{-9} \text{M}$$

Q.39 (1)
According to Raoult's law

$$p = p_A^{\circ} X_A + p_A^{\circ} X_B$$

$$290 = 200 \times 0.4 + p_B^{\circ} \times 0.6$$

$$p_B^{\circ} = 350$$

Q.40 (3)
Solute-Solvent interactions > Solute-solute or solvent-solvent interaction ↓
interactions are high
So, bonds cannot easily break thats why vapours decreases So, V.P. decreases negative deviation.

Q.41 (2)
Colligative property in decreasing order

$$Na_3PO_4 > Na_2SO_4 > NaCl$$

$$Na_3PO_4 \rightarrow 3Na^+ + PO_4^{3-} = 4$$

$$Na_2SO_4 \rightarrow 2Na^+ + SO_4^{2-} = 3$$

$$NaCl \rightarrow Na^+ + Cl^- = 2$$

Q.42 (3)
Osmosis is a process in which solvent (water in this case) flows from low conc^n sol^n to high concentration through SPM.

Q.43 (4)
$HA = H^+ + A^-$
$(1 - \alpha)\ \alpha \qquad \alpha$
$PH = 2 = [H^+] : 10^{-2} = C^2$
$\alpha = 0.1$
$i = 1 + \alpha = 1 + 0.1 = 1.01$

Q.44 (4)
Cu can't displace Al^{3+} ion from aluminium nitrate.

Q.45 (1)
More negative E^o value more will be reducing power.
So reducing power order-
A> B > C

Q.46 (3)
$-\Delta G = 2.303\ RT \log K$

Q.47 (3)
In this Cl^- will oxidise to give Cl_2 Na^+ water reduction potential has higher potential than that of water reduction potential, so water will reduce to give H_2.

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)

$$\Lambda^{\circ}_{m[K_2SO_4]} = 2\lambda^{\circ}_{mK^+} + 1\lambda^{\circ}_{mSO_4^{-2}}$$

$\therefore$ So Correct Ans. (2)