KCET Full Test-01_Chemistry Only Solutions

Q.1 (A)

Sol. For $t_{1/2}$ of first order reaction

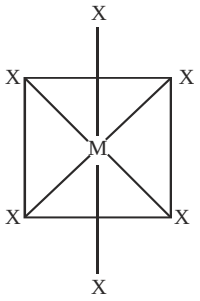
$$t_{1/2} = \frac{0.693}{k}$$

Q.2 (C)

Sol. Aromatic Aldehyde will not give Fehling test

Q.3 (A)

Sol. In octahedral structure MX_6, the six hybrid orbitals (sp^3d^2) are directed towards the corners of a regular octahedral with an angle of 90°. According to following structure of MX_6 the number of X-M-X bonds at 90° must be Twelve.



Q.4 (C)

Sol. NH_3 has lone pair of electron while BF_3 is electron deficient compound so they form a co-ordinate bond $NF_3 \rightarrow BF_3$

Q.5 **(C)**

Q.6 (C)

Q.7 (B)

Pm (promethium) is an artificial or synthetic element.

Q.8 (B)

Sol. $\Delta H = +ve$ for endothermic reaction.

Q.9 (D)

Q.10 (D)

Sol. There are 6 electrons in its ultimate and penultimate shell.

Q.11 **(C)**

Q.12 (A)

Sol. $CH_3 - CH_2CH_2CH_3 \xrightarrow[\Delta]{AlCl_3 + HCl} CH_3 - \underset{\displaystyle CH_3}{\underset{|}{CH}} - CH_3$

Isomerization reaction

Q.13 (C)

Sol. $CoO + B_2O_3 \rightarrow \underset{\text{Blue}}{Co(BO_2)_2}$

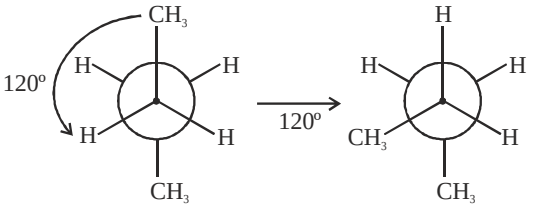
$Cr^{3+} \rightarrow$ Green, $Fe^{3+} \rightarrow$ Yellow, $Cu^{2+} \rightarrow$ Blue

Q.14 (A)

Sol. $\frac{1}{t}\ell n\left(\frac{0.9}{0.9-0675}\right) = \frac{1}{1}\ell n\left(\frac{0.8}{0.8-0.6}\right) \Rightarrow t = 1 \text{ hr}$

Q.15 *(D)*

Sol.



Gauche form

Q.16 (D)

Sol. Magnetic moment depends upon the number of unpaired electron.

d^3 : 3 Unpaired electron

d^2 : 2 Unpaired electron

d^8 : 2 Unpaired electron

d^6 : 4 Unpaired electron

Q.17 **(C)**

Q.18 (D)

Sol. Tollen's reagent oxidizes the compound having aldehyde group like glucose and also oxidizes a-hydroxy ketones having $-COCH_2OH$ group as in fructose.

Q.19 **(A)**

Q.20 (B)

Sol. $CH_3-\underset{\displaystyle CH_3}{\underset{|}{\overset{\displaystyle CH_3}{\overset{|}{C}}}}-Br + NaOCH_3 \rightarrow \underset{(A)}{CH_3-\overset{\displaystyle CH_3}{\overset{|}{C}}=CH_2}$

Q.21 (B)

Sol. In an octahedral crystal field t_{2g} orbitals are lowered in energy by $0.4\ \Delta_0$.

Q.22 (A)

Sol. $N_{2(g)} + O_{2(g)} \rightleftharpoons 2NO_{(g)}$ $\quad K_1$

Reverse the reaction

$2NO_{(g)} \rightleftharpoons N_{2(g)} + O_{2(g),}$ $\quad 1/K_1$

Divide the above equation by 2

$NO_{(g)} \rightleftharpoons \frac{1}{2}N_{2(g)} + O_{2(g)}$ $\quad (1/K_1)^{1/2}$

$\left(\frac{1}{K_1}\right)^{1/2} = K_2\left(\frac{1}{K_1}\right)^{1/2} = K_2 \quad \Rightarrow K_1\left[\frac{1}{K_1}\right]^{1/2}$

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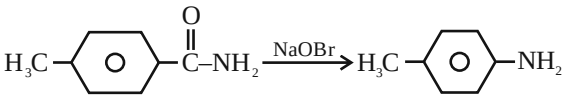
Q.23 (C)

Sol. $x - 2 + 5(0) = 0$

$x = +2$

C.N. = 6

Q.24 (C)

Sol. 

Q.25 (B)

Sol. (I) $[Ni(CO)_4]$ $Ni = 3d^8 4s^2$(SFL) $\mu = 0$

(II) $[Ni(H_2O)_6]^{2+}$ $Ni^{2+} = 3d^8$ (WFL) $t_{2g}^{2,2,2}, e_g^{1,1}$,

So, unpaired electron is 2, $\mu = \sqrt{8}$BM

(III) $[Ni(CN)_4]^{2-}$ $Ni^{2+} = 3d^8$ (SFL) $\mu = 0$

(IV) $[Pd(PPh_3)_2Cl_2]$ $Pd^{2+} = 4d^8$ $\mu = 0$

Q.26 (D)

Sol. Since the oxidation number of Ni increases from 0 to 2, therefore it acts as reducing agent.

Q.27 (C)

Similar charges closer to each other destabilised resonating structure.

Q.28 **(B)**

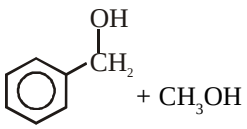
$K_4[Fe(CN)_6]$ is a coordination compound generally represented by [ ] bracket.

Q.29 (D)

Sol. Solid + Heat $\rightarrow$ Liquid

Hence, when heat is added to the equilibrium then according to Le-Chatelier's principle equilibrium shifts in the direction where heat is consumed that is, in the forward direction to form more liquid and amount of solid to decrease.

Q.30 (B)

Sol. $C_6H_5COOCH_3 \xrightarrow[H_2O/H^+]{LiAlH_4}$  $+ CH_3OH$

Q.31 (D)

Sol. Fe_3O_4 : $3x + 4(-2) = 0 \Rightarrow x = 8/3$

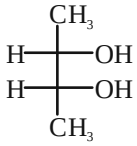
Q.32 (C)

Sol. It is a case of Hofmann elimination reaction. In this terminal alkene is the major product. And strong base such as tert butoxide will give best elimination product.

Q.33 (B)

Sol. When blood cells are placed in a solution of similar concentration as that of blood then they neither swell nor shrink. It means that the concentration of solution is same as that of inside of blood cell, i.e., they are isotonic.

Q.34 (B)

Sol. 

It contains plane of symmetry so it is optically inactive.

Q.35 (B)

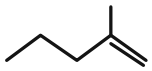
Sol. The emf of the cell cannot be zero because concentration of H^+ ions in two electrolytic solutions is different. HCl is a strong acid while acetic is a weak acid and hence their pH will be different.

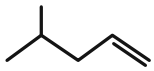
Q.36 **(B)**

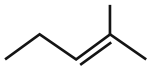
Q.37 (B)

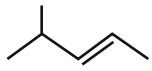
Sol. The relative lowering of the vapour pressure of dilute solution is equal to the mole fraction of the solute molecule present in the solution.

Q.38 (D)

Sol. (A)  2-methylpent-1-ene

(B)  4-methylpent-1-ene

(C)  2-methylpent-2-ene

(D)  4-methylpent-2-ene

Only 4-methylpent-2-ene shows geometrical isomerism.

Q.39 **(D)**

Q.40 (A)

Sol. $R\text{-}MgX + CH_3 - CH_2$

$R\text{-}MgX + CH_3\text{–}CH_2$

$O \rightarrow R\text{–}CH_2CH_2O\text{–}MgX$

$\xrightarrow[\Delta]{H_2O/H^+} R\text{–}CH_2\text{–}CH_2OH + Mg(OH)X$

Q.41 (C)

Sol. Osmotic pressure is a colligative property (i.e., it depends on number of particles only).

Other colligative properties are

– Depression in freezing point

– Elevation in boiling point

– Relative lowering in vapour pressure.

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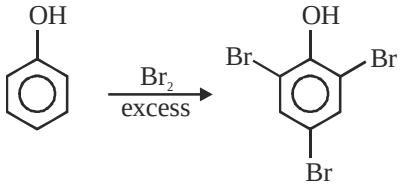
Q.42 (D)

Sol.



Q.43 (C)

Sol. Given that

I = 5 ampere

t = 40 min = 40 × 60 = 2400 sec

Amount of electricity passed

Q = It = 5 × 2400 = 12000 C

$Zn^{+2} + 2e^- \longrightarrow Zn$ $(n = 2e^-)$

From Faraday first law,

$W = Zlt$ (Z = equivalent mass)

$= \frac{Mass}{nF}$ (Mol.Mass of Zn = 65.39)

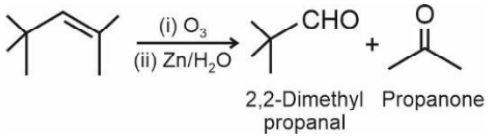
$= \frac{65.39}{2 \times 96500}$ g Zinc

Therefore, 12000 C charge will deposit

$= \frac{65.39 \times 12000}{2 \times 96500} = 4.065$ g of Zn

Q.44 (C)

Sol.



Q.45 (A)

Sol. As osmotic pressure is a colligative property i.e., it depends only on number of particles.

Among the given options only $CaCl_2$ gives the highest number of particles (ions) on dissociation.

$CaCl_2 \longrightarrow Ca^{2+} + 2Cl^-$ (3 ions)

While KCl gives only two particles (ions)

$KCl \longrightarrow K^+ + Cl^-$ (2 ions)

Glucose and urea do not dissociate and thus behave as single particles.

Thus, highest osmotic pressure is exerted by $CaCl_2$.

Q.46 (B)

Sol. Ambident nucleophiles have more than one site of attack.

Q.47 **(B)**

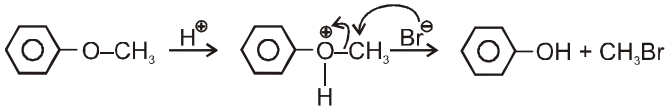
Q.48 (D)

Sol. EAS $\mu s \frac{1}{EWG}$ on Benzene ring.

Q.49 (D)

Q.50 (D)

Sol.

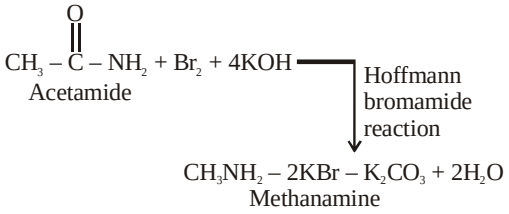


Q.51 (A)

Sol. Those having maximum value of standard reduction potential are the strongest oxidizing agent, here Mg^{2+} is the strongest oxidizing agent.

Q.52 (A)

Sol.



Q.53 **(B)**

Q.54 (B)

Sol. Aromatic diazonium salts are more stable due to dispersal of the positive charge on benzene ring.

Q.55 (C)

Q.56 **(D)**

Q.57 (A)

Q.58 **(B)**

Q.59 (B)

Sol. The ionic radii increases with decreases in the effective nuclear charge.

Q.60 (B)