Daily Tutorial Sheet-5	Level-1

61.(A) **I :** If conjugate base (anion) is smaller, it is very effectively solvated.

II : As +I effect of R alkyl groups increases, acid strength decreases.

III : Alkynes are more acidic than alkenes and alkanes due to sp-hybrid electron withdrawing carbon atom.

62.(A) $$\underset{\beta}{CH_3-CH_2-\overset{\overset{O}{||}}{C}}-\underset{\alpha}{\overset{*}{C}H_2}-\overset{\overset{O}{||}}{C}-OH \xrightarrow[-CO_2]{\Delta} \underset{(A)}{CH_3-CH_2-\overset{\overset{O}{||}}{C}-\overset{*}{C}H_3} \xrightarrow[I_2]{NaOH} \underset{(B)}{\overset{*}{C}HI_3} + C$$

$$\underset{(C)}{CH_3-CH_2-\overset{\overset{O}{||}}{C}-ONa} \xrightarrow[\Delta]{NaOH/CaO} \underset{(D)}{CH_3-CH_3}$$

63.(B) $$RCH_2COOH \xrightarrow[2.\ H_2O]{1.\ P/Br_2} R\underset{\underset{Br}{|}}{C}H-COOH \xrightarrow[alc.]{NH_3} R-\underset{\underset{NH_2}{|}}{C}HCOOH\ (Y)$$

64.(D) Option (D) is correct in general except when CH_3OH is considered as it is more acidic than H_2O.

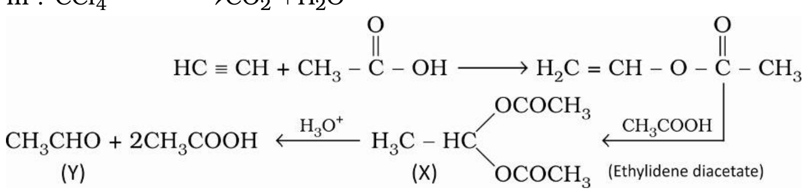
65.(C) $$CH_3COOH \xrightarrow{SOCl_2} CH_3COCl \xrightarrow[AlCl_3]{C_6H_6} Ph-\overset{\overset{O}{||}}{C}-CH_3 \xrightarrow[H_3O^+]{HCN} Ph-\overset{\overset{OH}{|}}{\underset{\underset{COOH}{|}}{C^*}}-CH_3$$

* Chiral centre
* α -hydroxy acid

$\Rightarrow$ A, B are correct

66.(C) I : $CH_3NC \xrightarrow{H_3O^+} CH_3NH_2 + HCOOH$ II : $CHCl_3 \xrightarrow[H_3O^+]{NaOH} HCOOH$

III : $CCl_4 \xrightarrow{H_3O^+} CO_2 + H_2O$

67.(B)


68.(D) $$CH_3-\overset{\overset{O}{||}}{C}-OH(aq) \rightleftharpoons H^+_{aq} + \underset{\text{(resonance stabilised)}}{CH_3-\overset{\overset{O}{||}}{C}-O^-}\ \text{(conjugate base)}$$

69.(A) This is Cross-Claisen condensation.
CH_3COOEt loses $\alpha-H$ and C_6H_5COOEt loses EtO^- to give a β-keto ester.

$$C_6H_5-\overset{\overset{O}{||}}{C}-OEt + \underset{\underset{H}{|}}{C}H_2-COOEt \xrightarrow[H_3O^+]{EtONa} C_6H_5-\overset{\overset{O}{||}}{C}-CH_2-COOEt \xrightarrow[H^+]{OH^-} \underset{\beta-\text{keto acid}}{C_6H_5-\overset{\overset{O}{||}}{C}-CH_2-COOH}$$

$$\xrightarrow[-CO_2]{\Delta} C_6H_5-COCH_3$$

70.(ACD) **(A)** HCOOH ($pK_a = 3.77$) is stronger acid than CH_3COOH ($pK_a = 4.78$) as CH_3 group is an ERG (acid weakening)

(B) $HCOOH \xrightarrow{PCl_5} \underset{\text{(Unstable)}}{H-COCl} \longrightarrow CO + HCl$ [Formyl chloride is unstable at room temperature]

(C) $HCOOH \xrightarrow[\Delta]{H_2SO_4} H_2O + CO$

(D) $HCOOH + [Ag(NH_3)_2]^+OH^- \longrightarrow CO_2 + H_2O + Ag$

(HCOOH is easily oxidised even by mild oxidising agents such as Tollen's reagent and Fehling solution)

71.(C) $H_3C-C\equiv CH \xrightarrow{CH_3MgBr} CH_4 + CH_3-C\equiv C-MgBr \xrightarrow[2.\ H_3O^+]{1.\ CO_2} CH_3-C\equiv C-COOH$

72.(A) Reactivity of carboxylic acid derivatives is proportional to the stability of leaving group in acyl (Nu^-) substitution : which depends upon basicity of leaving species.
"A weaker base is a good leaving group".

The order of basicity of leaving ion is: $\underset{\text{(weak base)}}{Cl^-} < R-\overset{\overset{\Large O}{||}}{C}-O^- < -OR' < \underset{\text{(strong base)}}{NH_2^-}$

Hence Cl^- is batter leaving group and NH_2^- is a poor leaving group. Accordingly RCOCl will be most reactive and amide the least one.

73.(D) Remember this as fact that Urea (NH_2CONH_2) is used to destroy excess HNO_2, during diazotization.

74.(ABC) * $CH_3CN \equiv$ Acetonitrile or Ethanenitrile is the correct name.

* $\underset{\text{Carbamic acid}}{NH_2-\overset{\overset{O}{||}}{C}-OH} \xrightarrow[\Delta]{NH_3} NH_2\overset{\overset{O}{||}}{C}-NH_2$ (Urea : a diamide)

75.(A) $CH_3CHO \xrightarrow{(EtO)_3Al} CH_3-\overset{\overset{O}{||}}{C}-OC_2H_5$ (A) (Tishchenko reaction)

$CH_3-\overset{\overset{O}{||}}{C}-OC_2H_5 \xrightarrow[2.\ H^+]{1.\ EtONa}$ Claisen-condensation

"one ester molecule loses α -H and other loses alkoxide to give -keto ester.