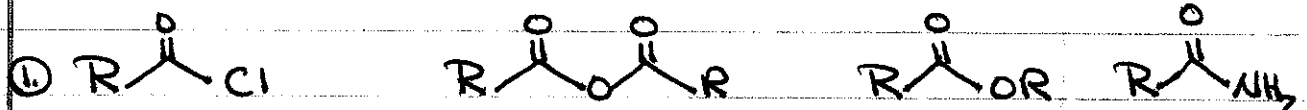
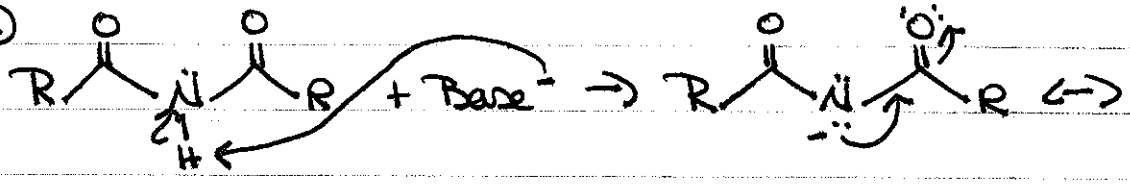
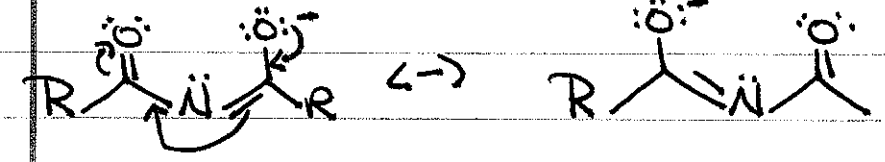
* Carboxylic Acid Derivative Warm-Up Answers

① 

Acid Chloride | Anhydride | Ester | Amide

② False: lone pair e⁻ are tied up in resonance w/ the carbonyl

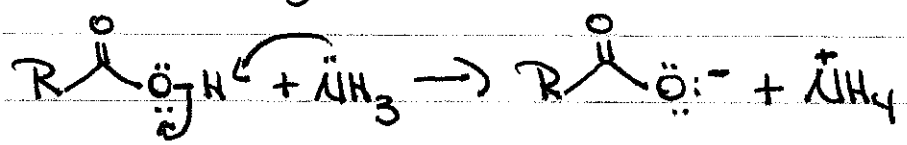
③ 



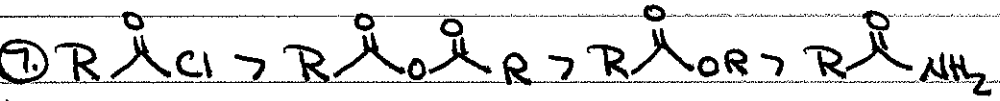
C. Base is resonance stabilized

④ Anhydrides: Carboxylic Acid + Acid Chloride

⑤ False: Amides Cannot directly be made from carboxylic acids due to acid/Base rxn



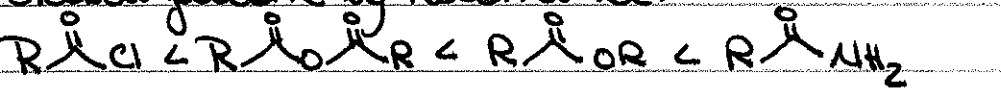
⑥ Nucleophilic Substitution : Nucleophilic addition : The tetrahedral intermediate of a derivative has a leaving group. The tetrahedral intermediate of an aldehyde or ketone does not have a leaving group.

⑦ 

leaving group ability:

$Cl^- > RCOO^- > RO^- > H_2N^-$

Stabilization by resonance:



⑧ Carboxylic acid

⑨ True

⑩ Esters + amides are less reactive therefore, require a catalyst for hydrolysis.

⑪ Ester : You can never make a more reactive derivative directly from a less reactive derivative.

⑫ The byproduct is HCl. In the presence of an acid, the ester will be hydrolyzed to a RCOOH. The acid byproduct must be neutralized by base,

pyridine, in order for the ester to remain.

(13.) Trans Esterification

(14.) Amide

(15.) The byproduct is an acid that must be neutralized by a base, 2nd mole of it, so that the amide is not hydrolyzed to a RCOOH.

(16.) 2 moles of Grignard: The 1st mole makes a ketone b/c the 1st tetrahedral intermediate has a leaving group.

(17.) Same as #16

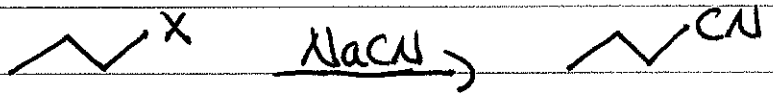
(18.) False: Gilman reagents attack C-X bonds. Acid Chloride is the only derivative w/a C-X bond.

(19.) Ketone

(20.) $LiAlH_4$

(21.) DIBAlH

(22.) 1°, 2°, + 3° Amines

(23.) 

(24.) Amide + $SOCl_2$

(25.) RCOOH : Acid or Base

(26.) 1° Amines : Imine anion + a dianion

(27.) Ketones: Imine anion