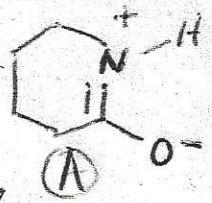
MAD ORG. CHEM "MIN." #: 26A

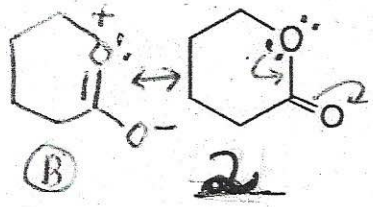
LAST NAME_____ FIRST NAME_____

ID#_____ Circle SECTION: **M/W** or **T/Th**



because (A) plays a bigger part in amide hybrid than (B) plays in ester hybrid (⊕ N more stable than ⊕ O)

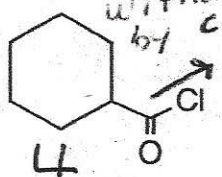
1. Place the following compounds in order of increasing reaction rate with methanol (1=least reactive, 4=most reactive):



(B)

2

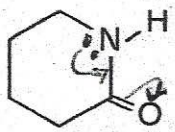
- ester more stable than anhydride
- less ⊕ carbonyl carbon → oxygen donates to only one carbonyl carbon



inductive withdrawal by Cl

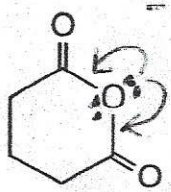
4

- least stable
- most ⊕ carbonyl carbon
- most reactive



1

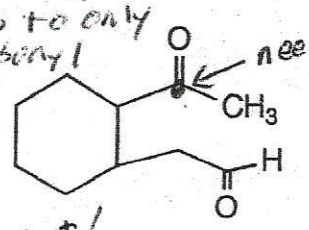
- amide is most stable
- least ⊕ carbonyl carbon → nitrogen can donate more e- density to carbonyl carbon than oxygen in ester (see ↑)



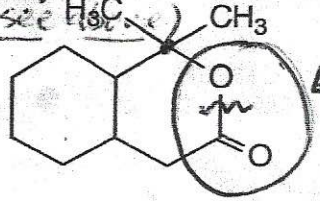
3

- resonance donation of oxygen shared by two carbonyl carbons
- each is more ⊕ than carbonyl carbon of ester

2.

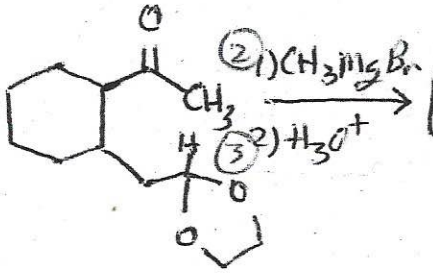


need another methyl & OH



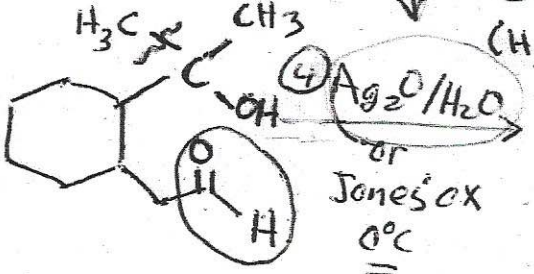
ester ↑ acid + alcohol

① HO OH / H^+ (1 eq)



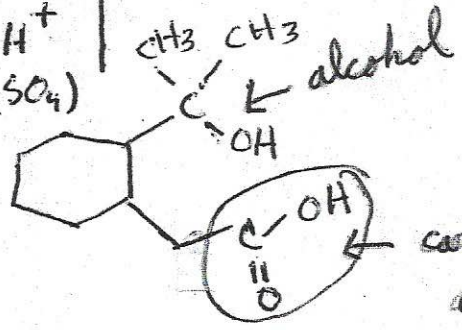
② 1) CH_3MgBr

③ 2) H_3O^+



heat

④ Ag_2O/H_2O or Jones ox 0°C



⑤ H^+ (H_2SO_4)

alcohol

carboxylic acid

3° alcohols readily dehydrate so best to avoid acid conditions for best yield