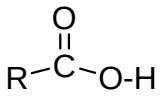
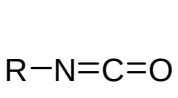
Sp2008 Organic II Exam #3 Ch 20-21 (100 points)

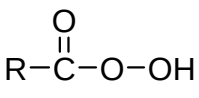
NAME: _____

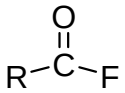
To **not** have your graded script placed outside my office please check this box ☐

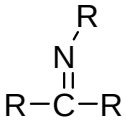
1) Name the general class of organic compounds that each of these molecules belong to. (15pts)

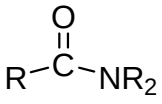


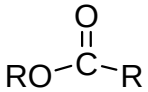


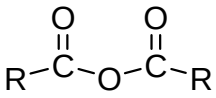


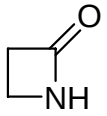


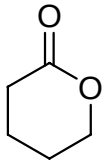










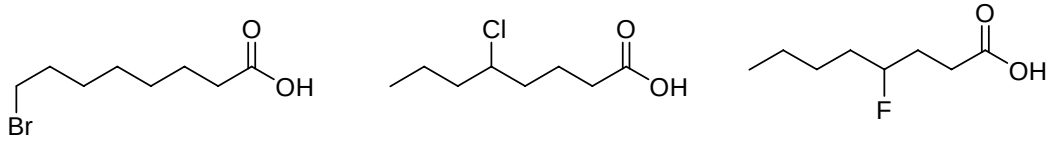


2) Put a cross through a molecule which is an epoxidizing agent (2pts)

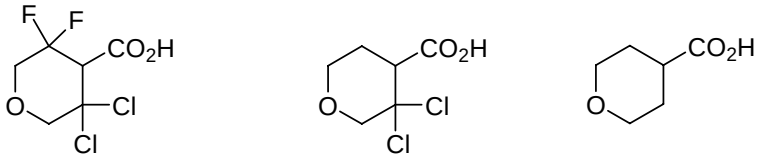
Circle the molecule with the most ring strain. (2pts)

3) Circle the strongest acid in the following sets. (12pts)

(a) CH_3-CO_2H CH_3CH_2-O-H CH_3CH_2-O-O-H

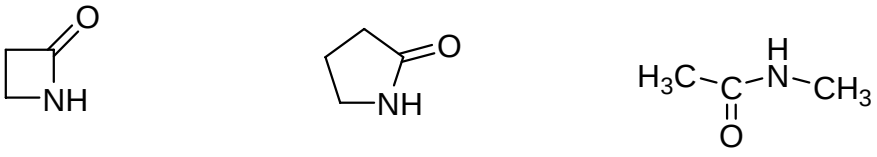
(b) 

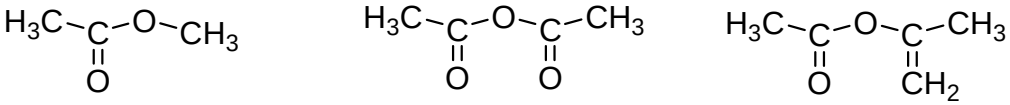
(c) CH_3OH NH_3 CH_4

(d) 

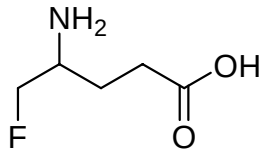
4) Circle the more reactive molecule with respect to nucleophilic acyl substitution. (6pts)

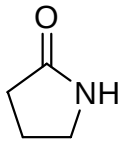
(a) CH_3CH_2-OH $CH_3-O-\overset{O}{\overset{\|}{C}}-CH_3$ $CH_3-O-\overset{O}{\overset{\|}{C}}-CF_3$

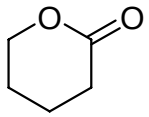
(b) 

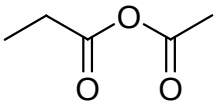
(c) 

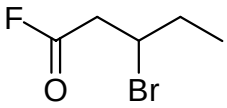
5) Name the following compounds in IUPAC acceptable terms. (20pts)

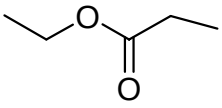




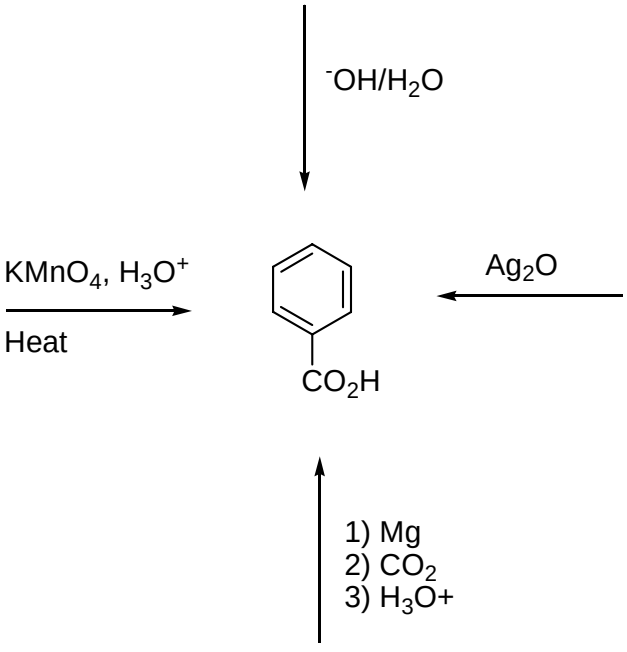






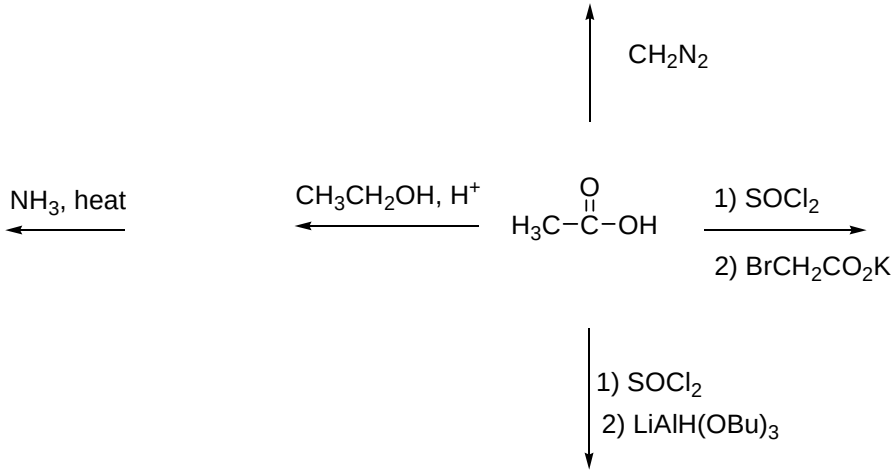


6) Benzoic acid can be made from a wide variety of benzene derivatives. Fill in the missing starting materials. (12pts)

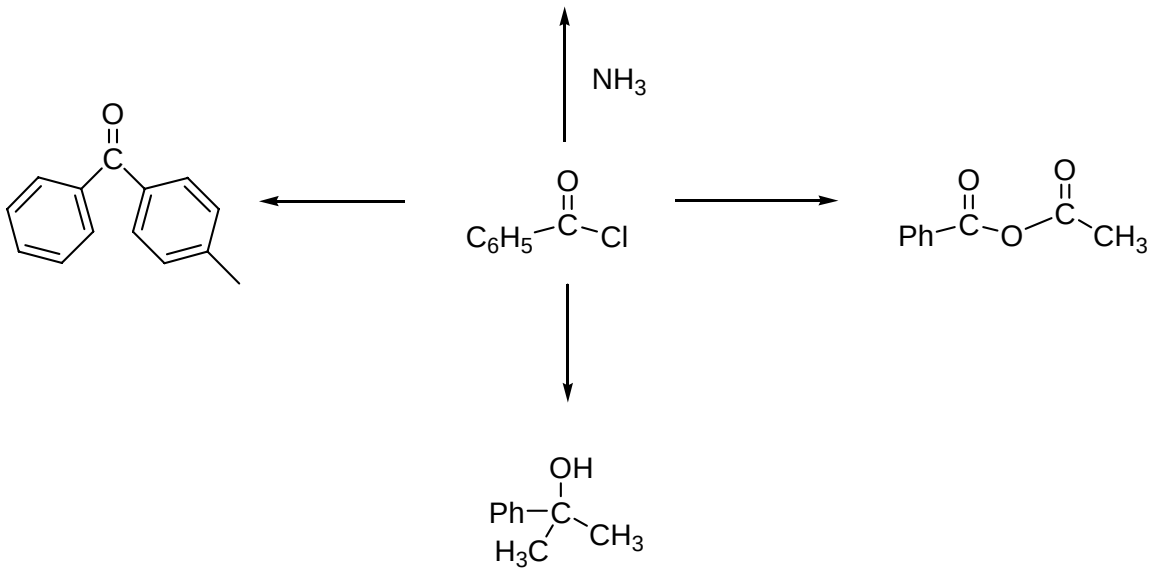


(7) Write the mechanism for the reaction of an alcohol with an anhydride, yielding an ester. (7pts)

(8) Provide the five products. (10pts)



9) (i) Fill in all the missing products or reagents. (8pts)



(ii) Draw the mechanism for **<u>one</u>** of the above reactions in part (9i). (6pts)

****BONUS QUESTION (2 points)****

Give two reasons why esters are more reactive than amides towards nucleophilic acyl substitution.

Sp2008 Organic II Exam #3 **Ch 20-21** **(100 points)**

NAME: COLETTE A. DAY

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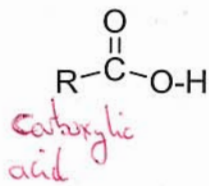
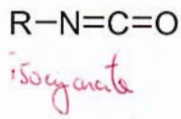
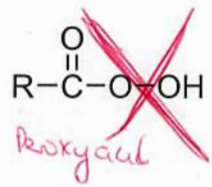
1) Name the general class of organic compounds that each of these molecules belong to. (15pts)



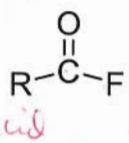
Carboxylic acid



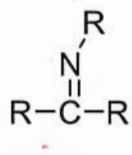
isocyanate



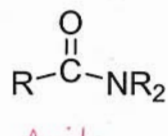
Peroxyacid



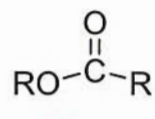
acid fluoride



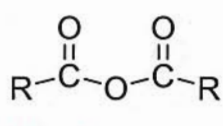
imine



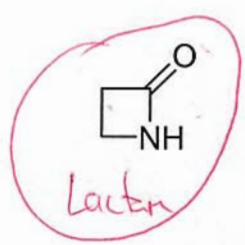
Amide



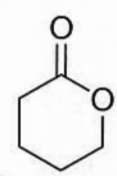
Ester



Anhydride



Lactam



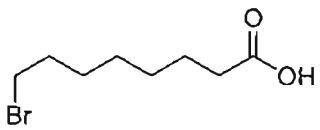
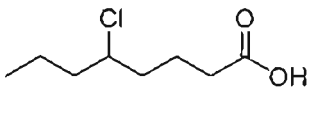
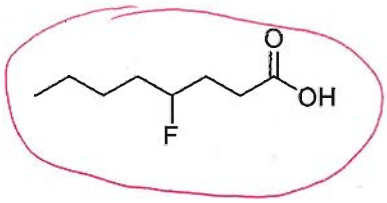
Lactone

2) Put a cross through a molecule which is an epoxidizing agent (2pts)

Circle the molecule with the most ring strain. (2pts)

3) Circle the strongest acid in the following sets. (12pts)

(a) CH_3-CO_2H CH_3CH_2-O-H CH_3CH_2-O-O-H

(b)   

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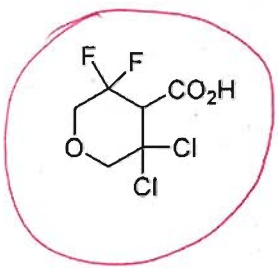
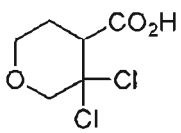
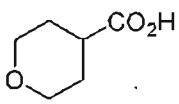
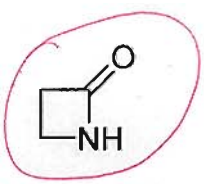
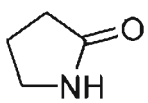
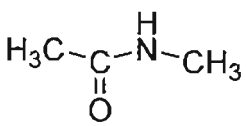
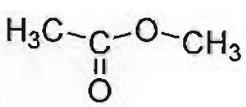
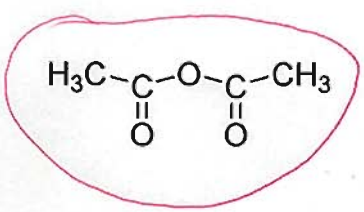
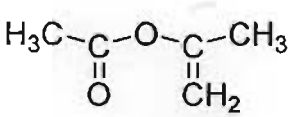
(d)   

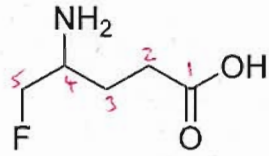
4) Circle the more reactive molecule with respect to nucleophilic acyl substitution. (6pts)

(a) CH_3CH_2-OH $CH_3-O-\overset{\overset{O}{\|}}{C}-CH_3$ $CH_3-O-\overset{\overset{O}{\|}}{C}-CF_3$

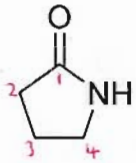
(b)   

(c)   

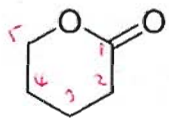
5) Name the following compounds in IUPAC acceptable terms. (20pts)



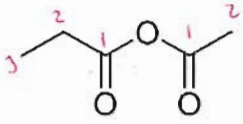
4-amino-5-fluoropentanoic acid



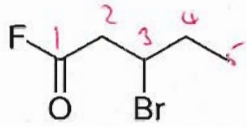
4-aminobutanoic acid lactam



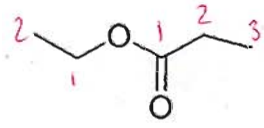
5-hydroxypentanoic acid lactone



Propanoic ethanoic anhydride

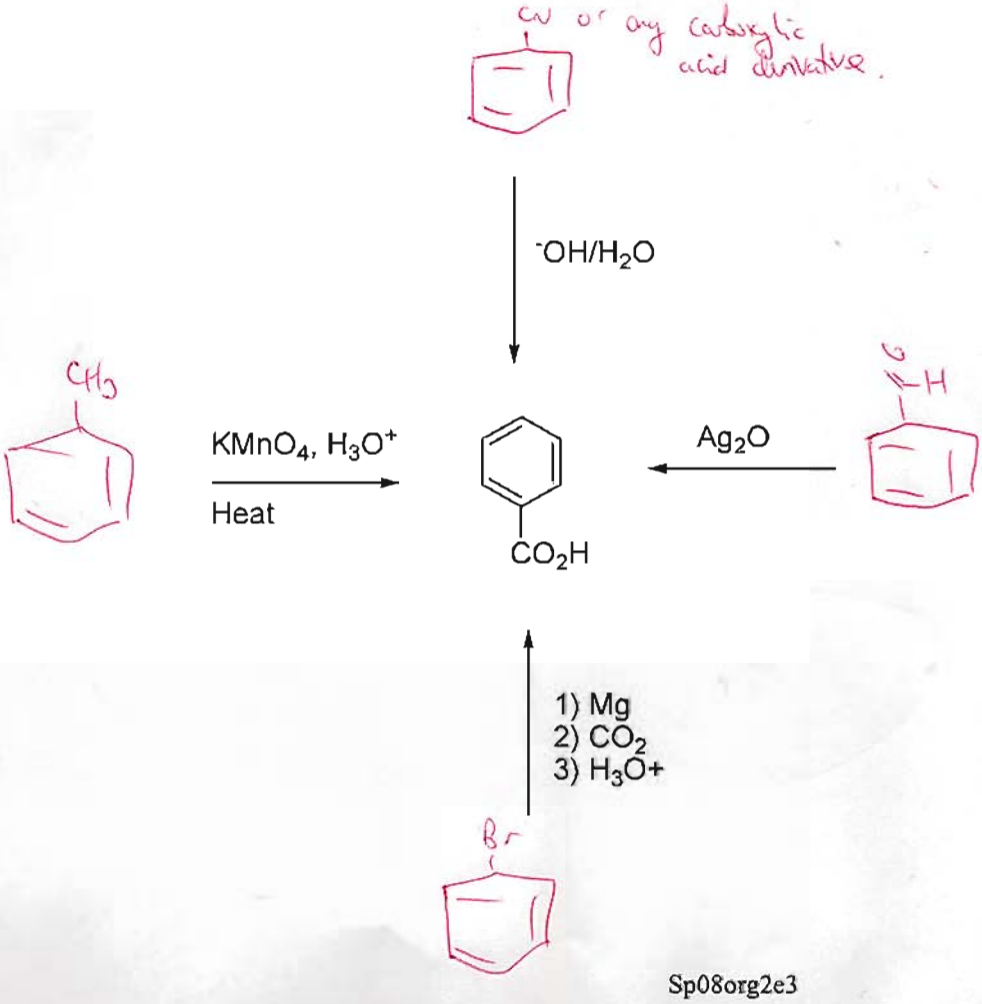


3-bromopentanoyl fluoride

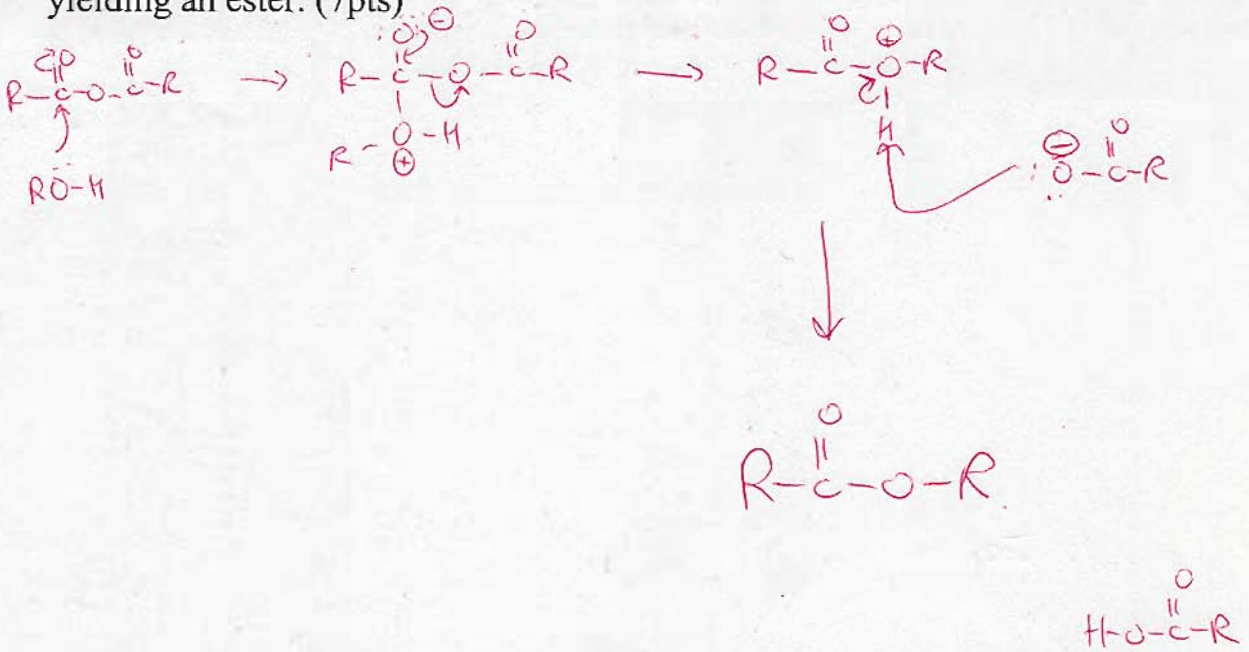


Ethyl propanoate

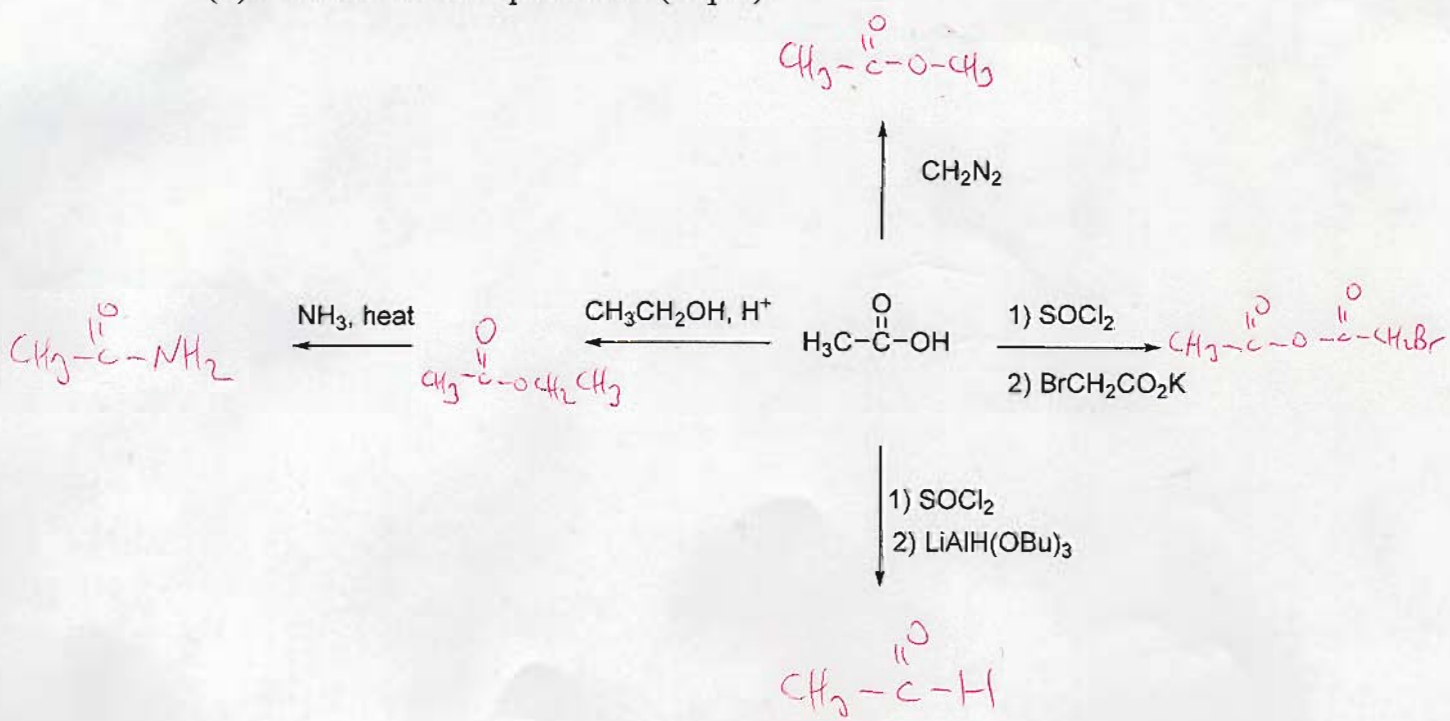
6) Benzoic acid can be made from a wide variety of benzene derivatives. Fill in the missing starting materials. (12pts)



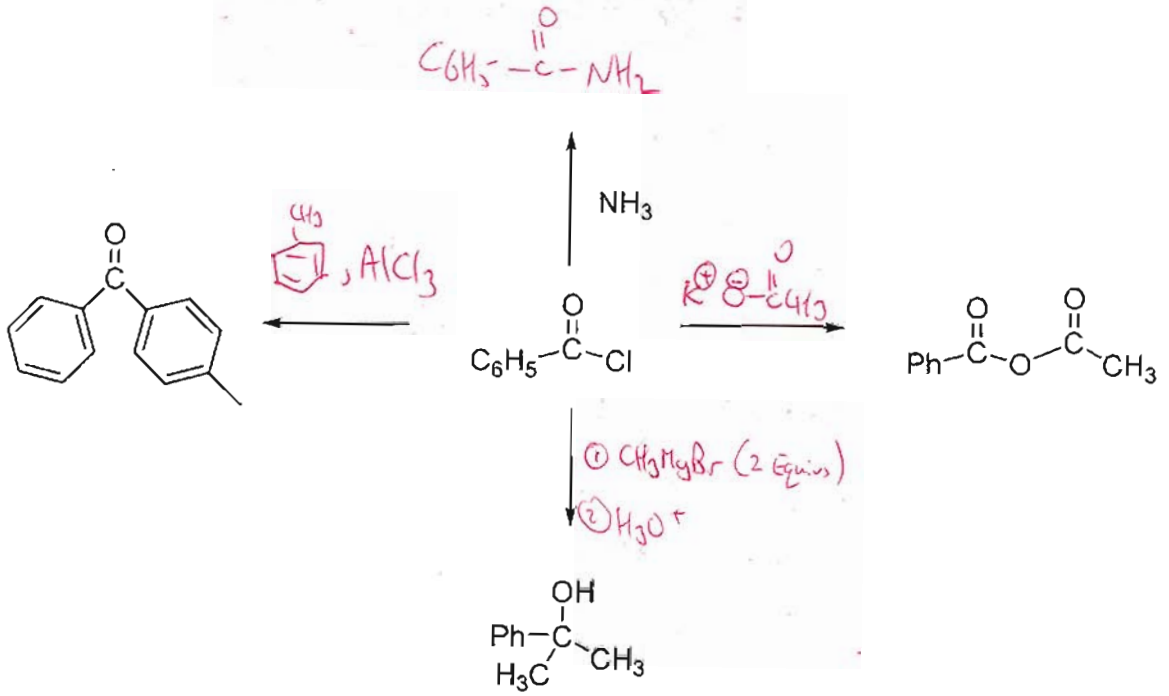
(7) Write the mechanism for the reaction of an alcohol with an anhydride, yielding an ester. (7pts)



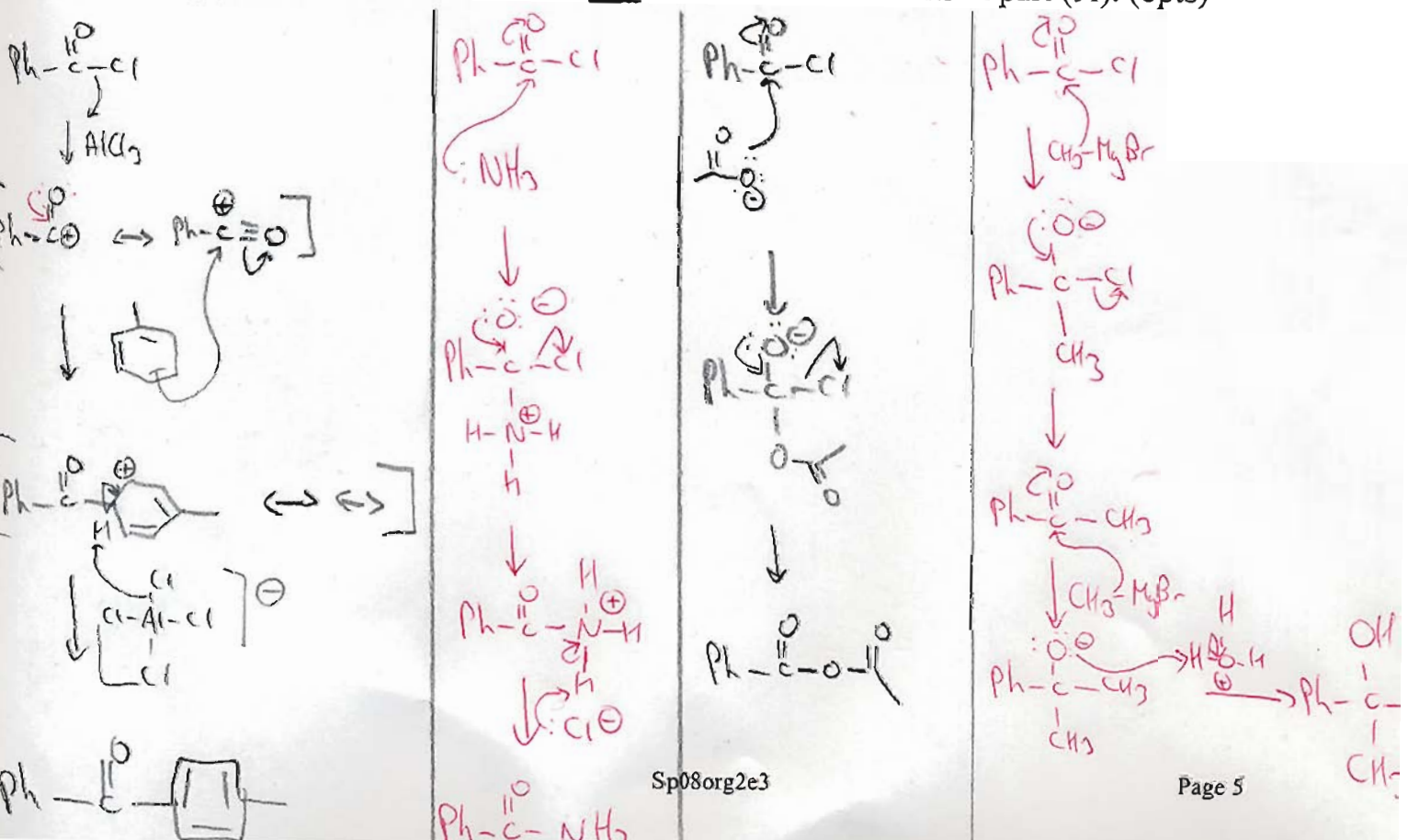
(8) Provide the five products. (10pts)



9) (i) Fill in all the missing products or reagents. (8pts)



(ii) Draw the mechanism for **one** of the above reactions in part (9i). (6pts)



****BONUS QUESTION (2 points)****

Give two reasons why esters are more reactive than amides towards nucleophilic acyl substitution.

- less resonance stabilization
- better leaving group.
- makes the $-\overset{\overset{O}{\|}}{C}-$ more +ve