

Name: \_\_\_\_\_

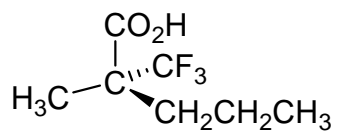
If you do **not** wish to have your graded exam placed outside my office please check here \_\_\_\_\_

1-15) are True or False (15pts)

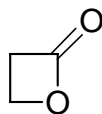
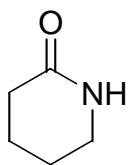
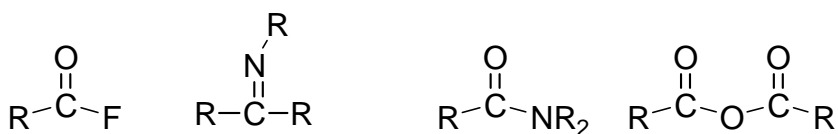
- 1) Carboxylic acid derivatives are compounds that can be hydrolyzed to produce carboxylic acids.
- 2) Anhydrides are called *anhydrides* because they are a product of two carboxylic acids when H<sub>2</sub>O is removed.
- 3) Acid chlorides undergo nucleophilic acyl substitution reactions.
- 4) Nitriles have an sp hybridized Carbon atom.
- 5) Nitriles have an sp hybridized Nitrogen atom.
- 6) Esters are more reactive than amides in nucleophilic acyl substitution reactions.
- 7) Anhydrides are more reactive than esters in nucleophilic acyl substitution reactions.
- 8) Carboxylic acids can be reduced to primary alcohols by Borane.
- 9) Amides have more resonance stability than esters.
- 10) Nucleophilic acyl substitution reactions proceed through a tetrahedral intermediate.
- 11) In a nucleophilic acyl substitution reaction, the acyl carbon progresses from sp<sup>2</sup> to sp<sup>3</sup> to sp<sup>2</sup>.
- 12) Nitriles are less basic than primary amines.
- 13) Lithium aluminum (tri-butoxy)hydride will convert acid chlorides to aldehydes.

14) Grignard reagents contain polar covalent Carbon-Magnesium bonds.

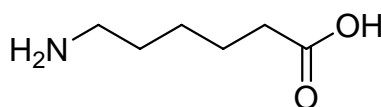
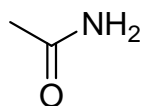
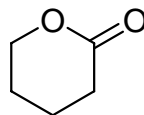
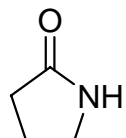
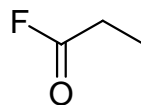
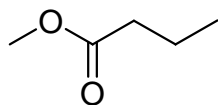
15) This molecule is chiral:



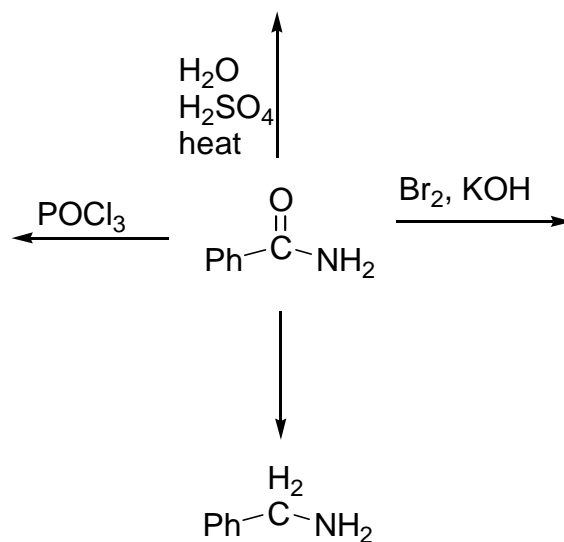
16) (10pts) Name the general class of organic compound that each of these molecules belong to.



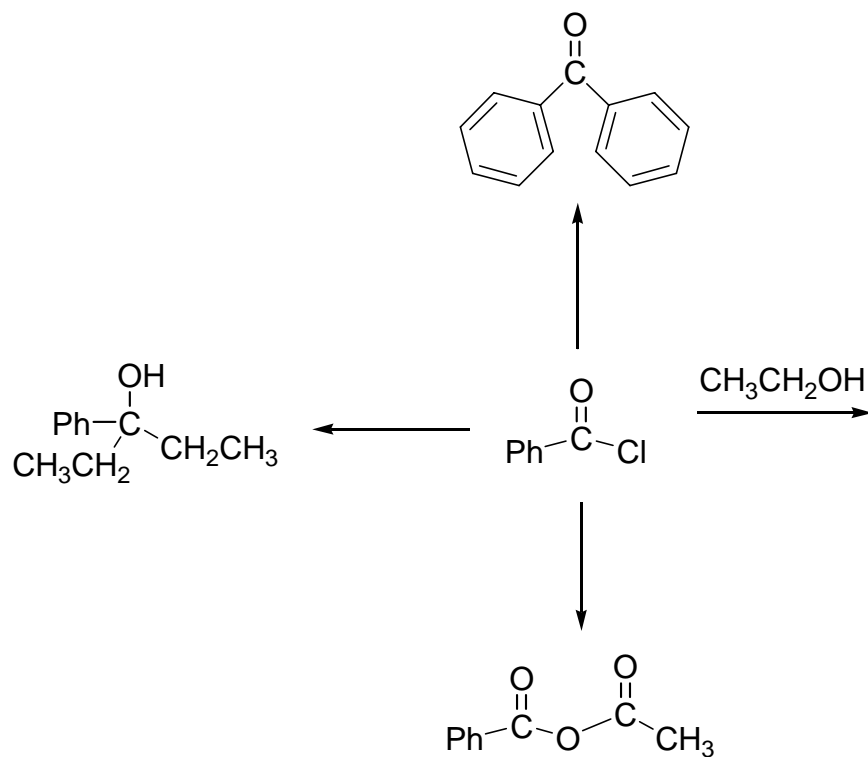
17) Name the following compounds in IUPAC acceptable terms. (18pts)



18) Fill in all the missing products or reagents. (12pts)

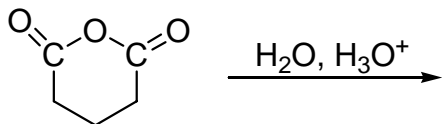
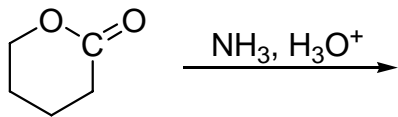


19) i) Fill in all the missing products or reagents. (12pts)



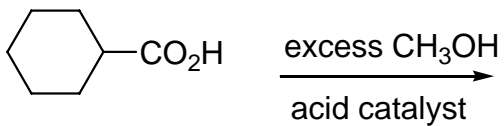
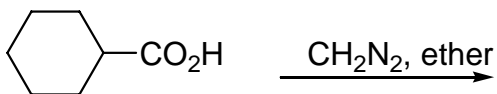
ii) draw the mechanism for **one** of the reactions above. (5pts)

20) Give the products for the following transformations. (6pts)



21) Draw two resonance structures for diazomethane,  $\text{CH}_2\text{N}_2$  (2pts)

Give the products for the following transformation. (6pts)



State one drawback of using diazomethane for chemical reactions (1pts).

22) Write the mechanism for the reaction of a SECONDARY AMINE with an ACID CHLORIDE to generate an AMIDE and H-Cl. (5pts)

23) Draw the *most acidic* isomer of dichlorobutanoic acid (4pts).

24) Draw the least acidic isomer of fluoropentanoic acid (4pts).

**\*Bonus question\* (up to 4pts)**

Write the mechanism for the reaction of *hydroxylamine* reacting with a *ketone* (in the presence of acid) to generate an *oxime*.

Name: BOB WIRE IZSHARPE

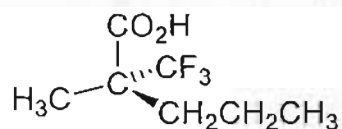
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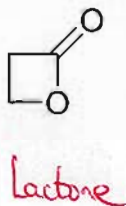
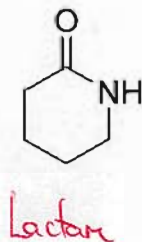
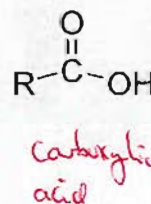
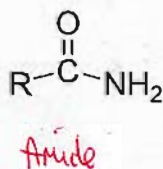
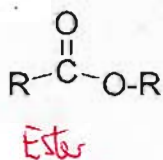
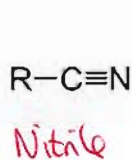
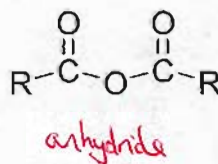
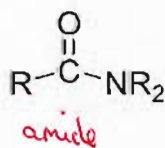
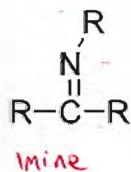
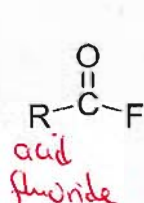
- 1) Carboxylic acid derivatives are compounds that can be hydrolyzed to produce carboxylic acids. T
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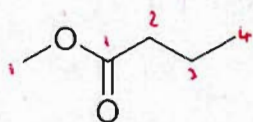
15) This molecule is chiral:



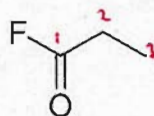
16) (10pts) Name the general class of organic compound that each of these molecules belong to.



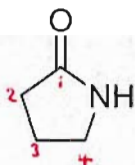
17) Name the following compounds in IUPAC acceptable terms. (18pts)



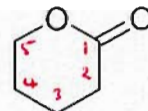
methyl butanoate



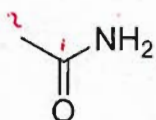
propanoyl fluoride



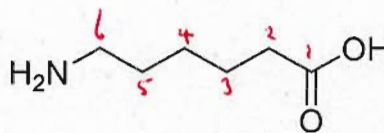
4-aminobutanoic acid lactam



5-hydroxypentanoic acid lactone

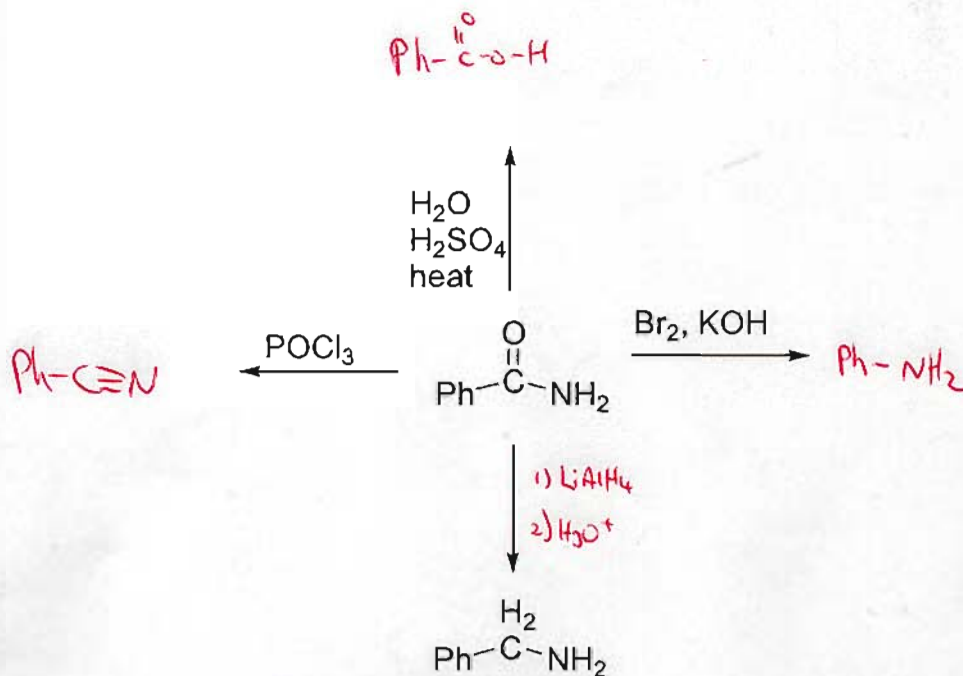


Ethanamide

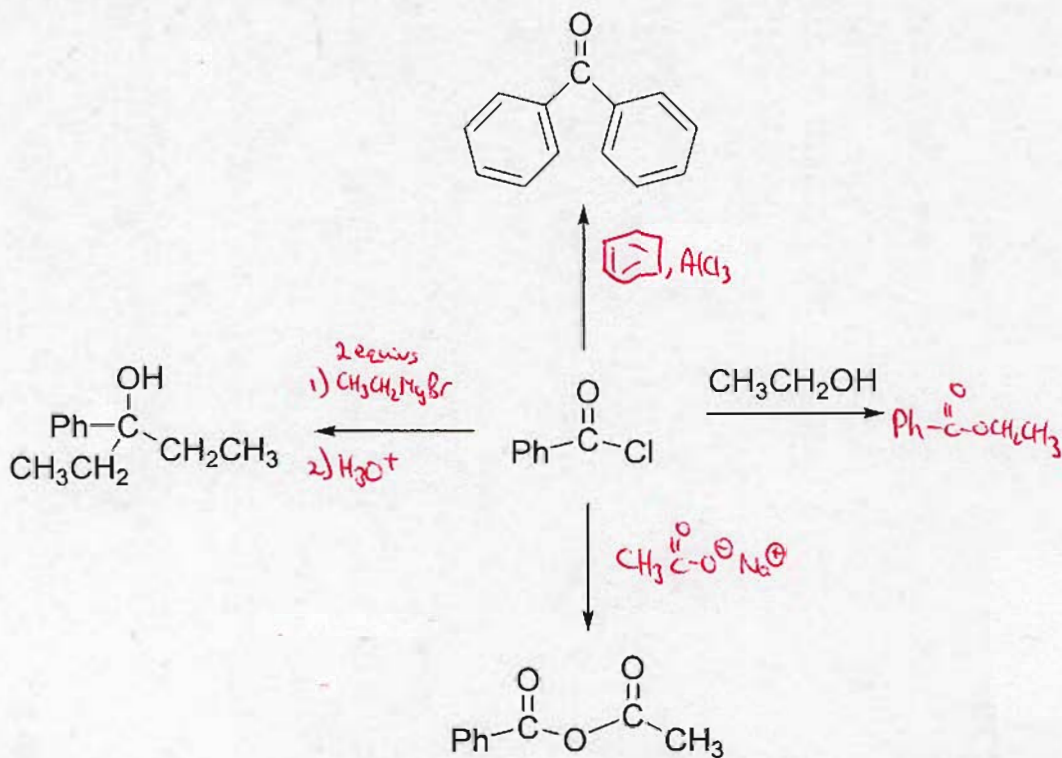


6-aminohexanoic acid

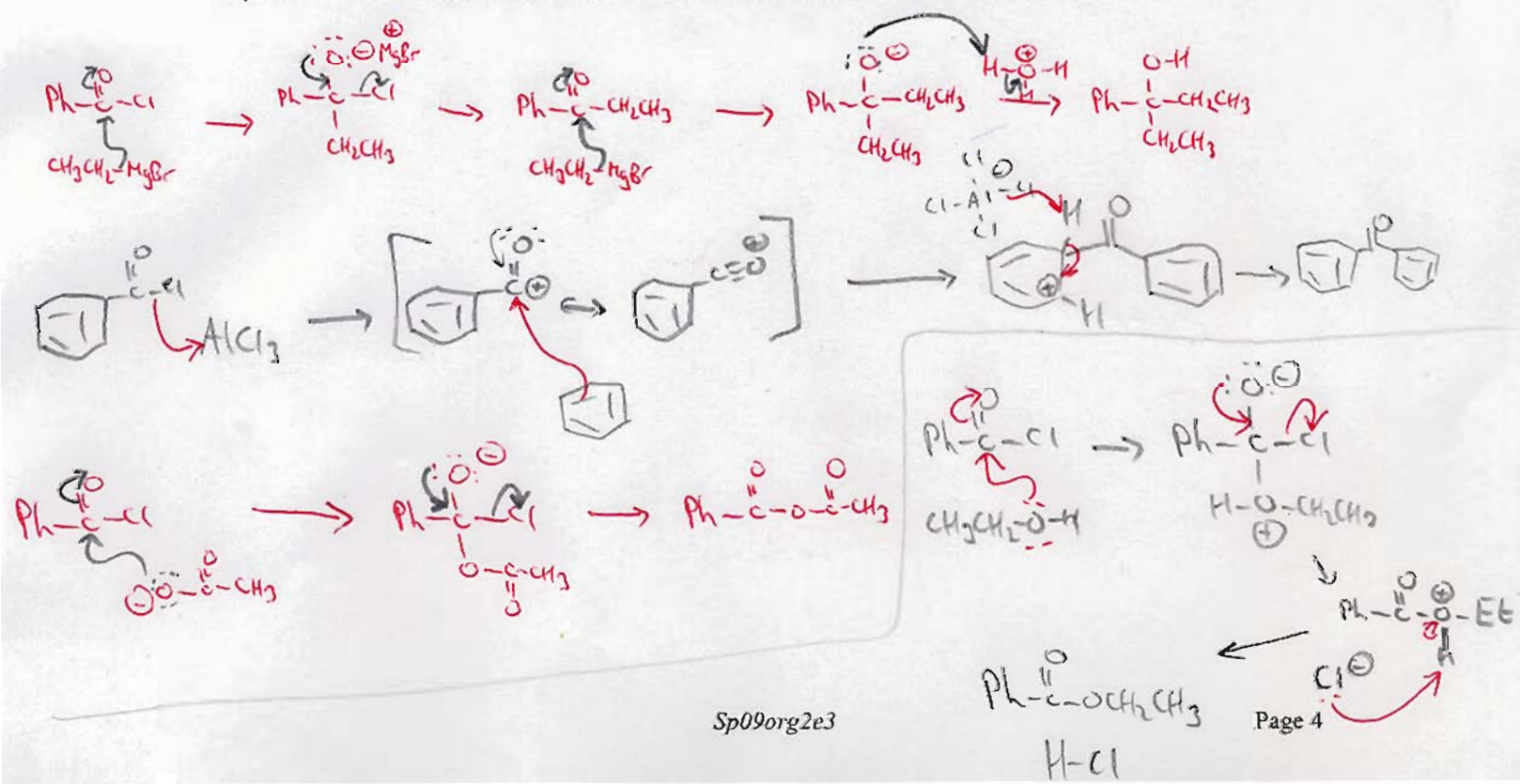
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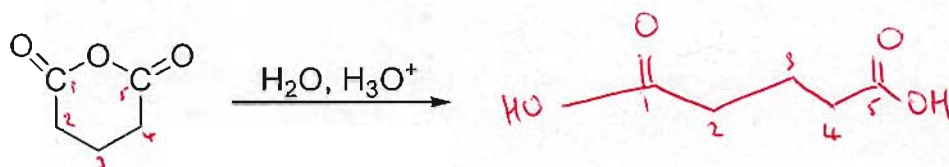
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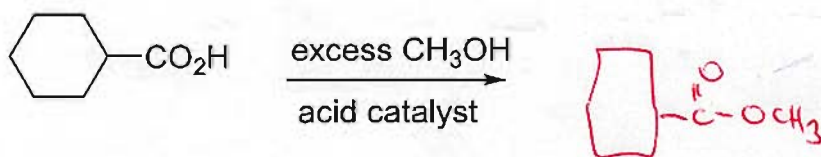
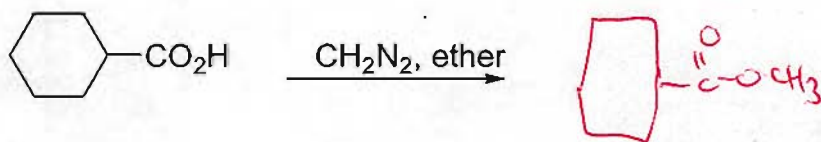
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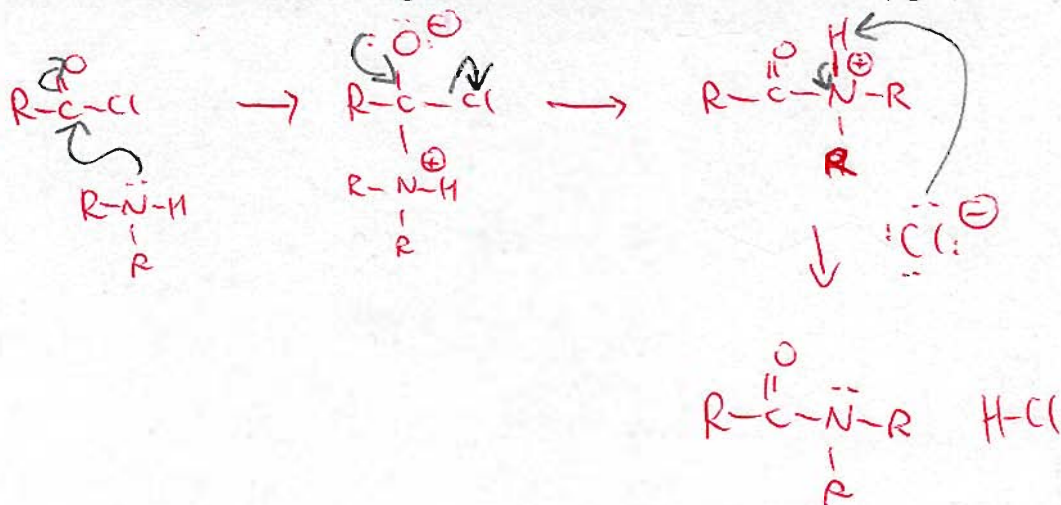
Give the products for the following transformation. (6pts)



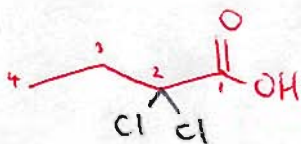
State one drawback of using diazomethane for chemical reactions (1pts).

*This reactive reagent is explosive & requires special glassware.*

22) Write the mechanism for the reaction of a SECONDARY AMINE with an ACID CHLORIDE to generate an AMIDE and H-Cl. (5pts)



23) Draw the *most acidic* isomer of dichlorobutanoic acid (4pts).



24) Draw the least acidic isomer of fluoropentanoic acid (4pts).



**\*Bonus question\* (up to 4pts)**

Write the mechanism for the reaction of *hydroxylamine* reacting with a *ketone* (in the presence of acid) to generate an *oxime*.

See sp09 org2e2 bonus.