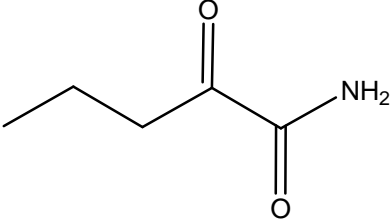
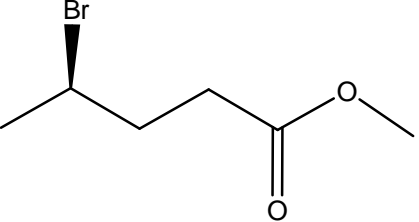
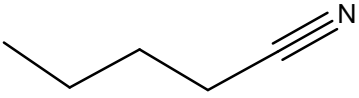
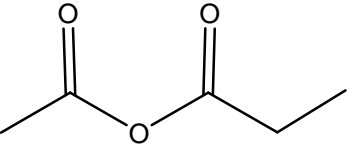
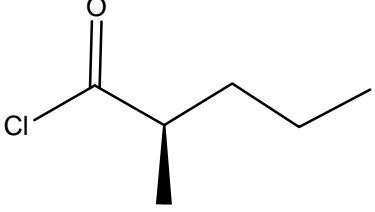
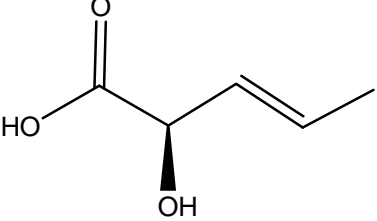
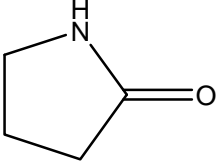
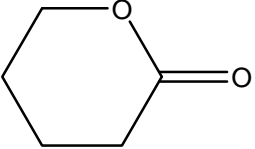


**Chapter 21 Worksheet**

1. Name the following compounds.

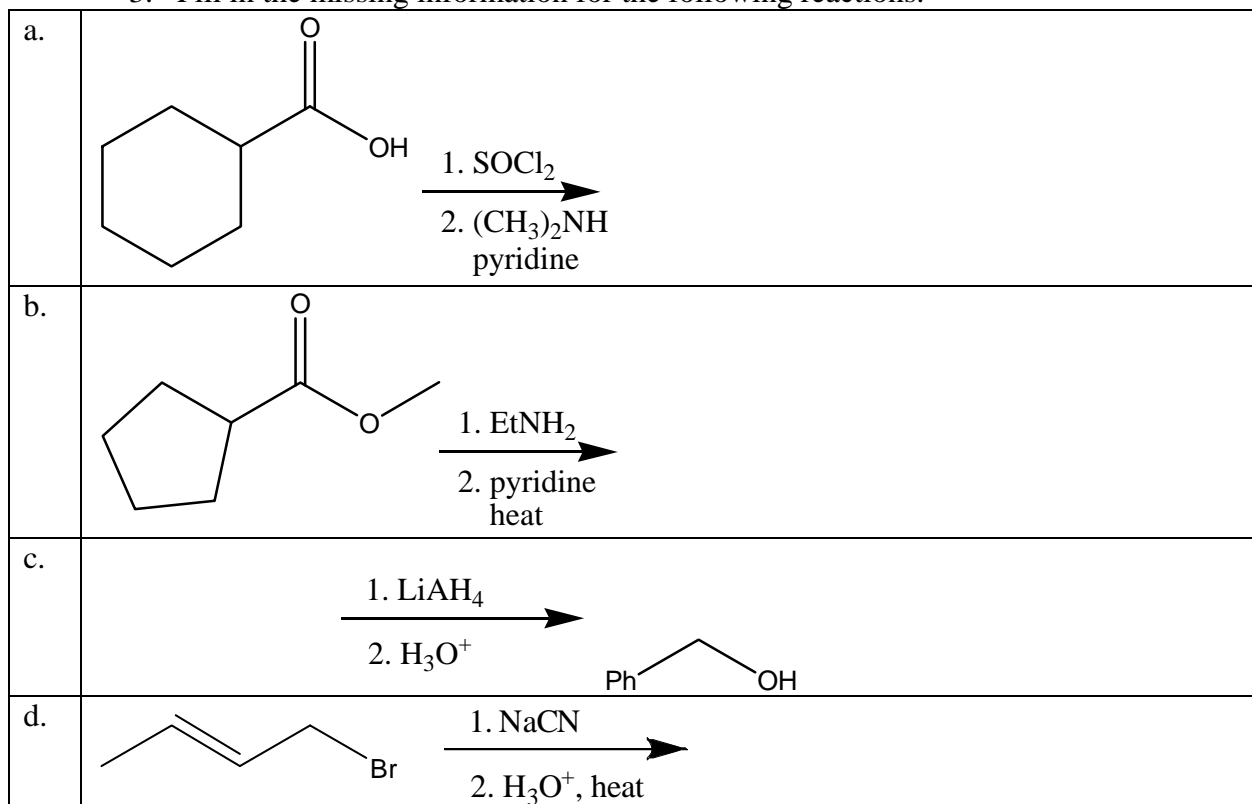
 <chem>CCCC(=O)C(=O)N</chem>	 <chem>CCCC(=O)OC</chem>
 <chem>CCCC#CC#N</chem>	 <chem>CCC(=O)OCC</chem>
 <chem>CCCC(=O)C(Cl)C</chem>	 <chem>CCCC(=O)C(O)C=C</chem>
 <chem>O=C1CCNC1</chem>	 <chem>O=C1CCOCC1</chem>

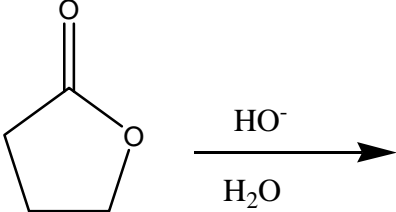
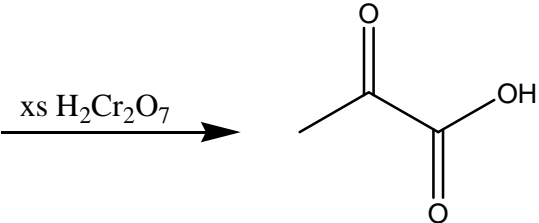
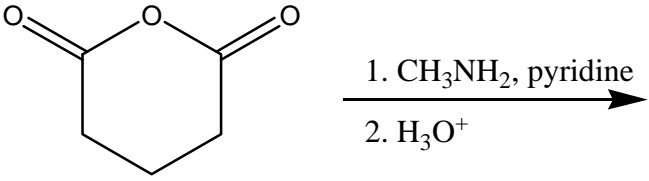
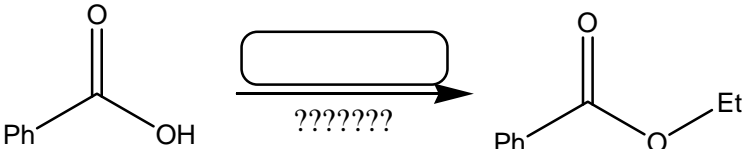
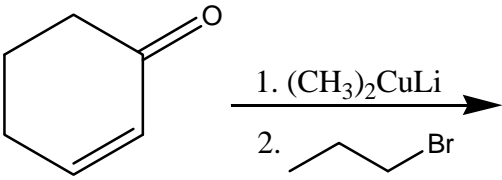
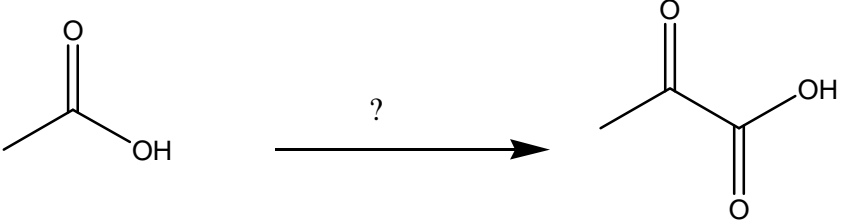
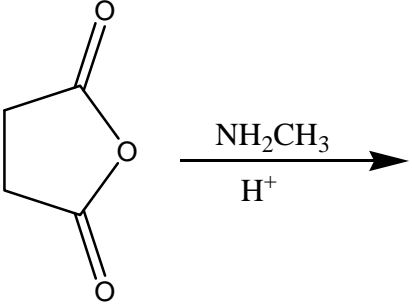
2. Draw the following compounds.

(R,E)-4-ethyl-N-methyl-3-oxohept-5-enamide

(S,Z)-isopropyl 7-amino-4-hydroxyoct-6-en-2-ynoate

3. Fill in the missing information for the following reactions.



e.	 <p>Reaction of succinone (a five-membered cyclic anhydride) with hydroxide (<math>\text{HO}^-</math>) in water (<math>\text{H}_2\text{O}</math>).</p>
f.	 <p>Reaction of acetone with excess dichromic acid (<math>\text{xs H}_2\text{Cr}_2\text{O}_7</math>) to form pyruvate.</p>
g.	 <p>Reaction of succinone with methylamine (<math>\text{CH}_3\text{NH}_2</math>) in pyridine, followed by acid workup (<math>\text{H}_3\text{O}^+</math>).</p>
h.	 <p>Reaction of benzoic acid (<math>\text{Ph-COOH}</math>) to ethyl benzoate (<math>\text{Ph-COOEt}</math>) using an unknown reagent (represented by a box with "??????").</p>
i.	 <p>Reaction of cyclohex-2-en-1-one with 1. <math>(\text{CH}_3)_2\text{CuLi}</math> and 2. propyl bromide (<math>\text{CH}_3\text{CH}_2\text{CH}_2\text{Br}</math>).</p>
j.	 <p>Reaction of acetic acid (<math>\text{CH}_3\text{COOH}</math>) to pyruvate (<math>\text{CH}_3\text{C(O)COOH}</math>) using an unknown reagent (represented by a "?").</p>
k.	 <p>Reaction of succinone with methylamine (<math>\text{NH}_2\text{CH}_3</math>) in the presence of acid (<math>\text{H}^+</math>).</p>

l.	$\text{H}_3\text{C}-\text{C}(=\text{O})-\text{NHCH}_3 \xrightleftharpoons[\text{H}_2\text{O}]{\text{H}^+}$
m.	$\text{CH}_3\text{COOCH}_3 \xrightleftharpoons[\text{H}_2\text{O}]{\text{HO}^-}$
n.	$\text{CH}_3\text{CH}_2\text{CN} \xrightarrow[\text{heat}]{\text{H}_3\text{O}^+}$
o.	$\text{CH}_3\text{CONH}_2 \xrightarrow[2. \text{H}_2\text{O}]{1. \text{LAH}}$
p.	$\text{CH}_3\text{COOH} \xrightarrow[2. \text{LiAl}(\text{tBuO})_3\text{H}]{1. \text{SOCl}_2}$

4. Propose a short synthesis for the following transformations.

a.	$\text{CH}_3\text{CH}_2\text{CH}_2\text{Br} \longrightarrow \text{CH}_3\text{CH}_2\text{COOH} + \text{HCOOH}$
b.	$\text{CH}_3\text{CH}_2\text{CH}_2\text{Br} \longrightarrow \text{CH}_3\text{CH}_2\text{CONH}_2$
c.	$\text{Cyclopentane ring with } =\text{CH}_2 \longrightarrow \text{Cyclopentane ring}-\text{CH}_2\text{CH}_2\text{COOCH}_3$
d.	$2 \text{ CH}_3\text{CH}_2\text{CH}_2\text{Br} \longrightarrow \text{CH}_3\text{CH}_2\text{COCH}_2\text{CH}_2\text{CH}_3$
e.	$\text{C}_6\text{H}_6 \xrightarrow{+\text{ one more source of carbon}} \text{C}_6\text{H}_5\text{COOH}$

5. Write a mechanism to explain the following reactions.

