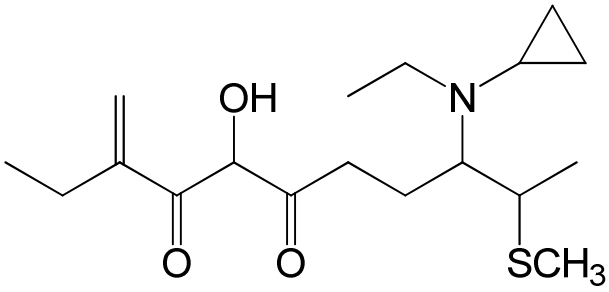
CHEM 266 – EXAM 3 (Fall 2017) **NAME_____Keys_____**

Tuesday November 28, 2017

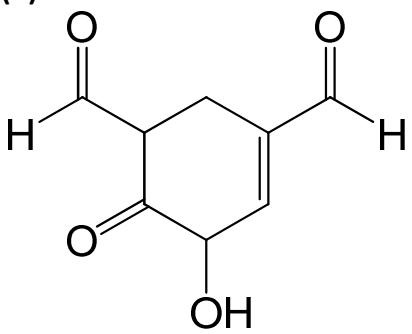
1. Name the following compounds (3 x 8 = 24 pts)

(a)



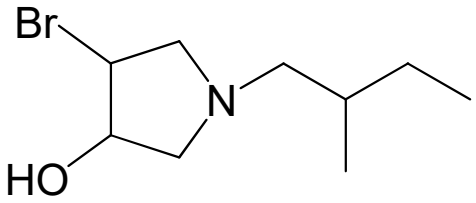
8-amino-*N*-cyclopropyl-2,*N*-diethyl-4-hydroxy-9-methylthiodec-1-ene-3,5-dione

(b)



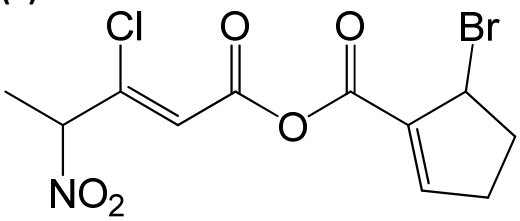
5-hydroxy-6-oxocyclohex-3-ene-1,3-dicarbaldehyde

(c)



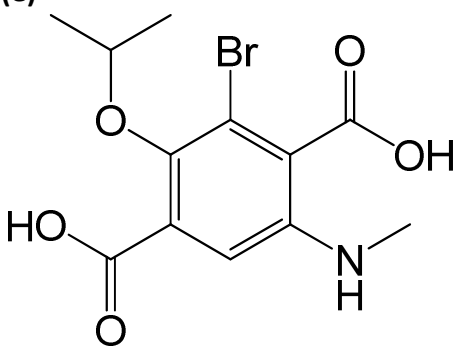
4-bromo-1-(2-methylbutyl)pyrrolidin-3-ol
Or
4-bromo –*N*-sec-pentyl pyrrolidin-3-ol

(d)



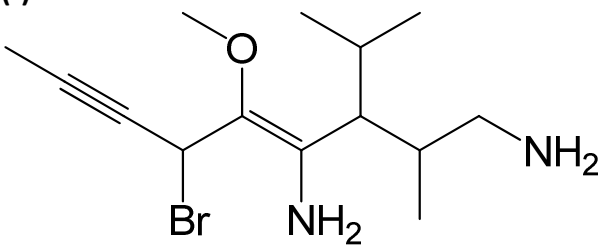
5-bromocyclopent-1-enecarboxylic 3-chloro-4-nitropent-2-enoic anhydride

(e)



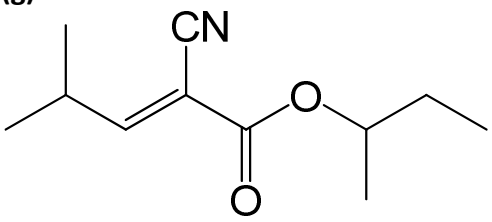
5-amino-3-bromo-2-isopropoxy-*N*-methylbenzene-1,4-dicarboxylic

(f)



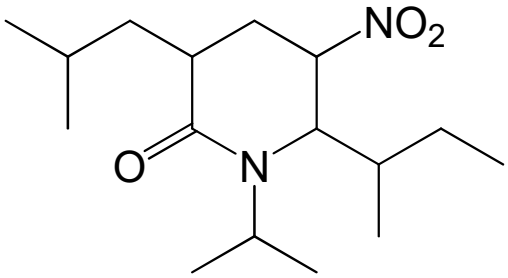
6-bromo-3-isopropyl-5-methoxy-2-methylnon-4-en-7-yne-1,4-diamine

(g)



***sec*-butyl 2-cyano-4-methylpent-2-enoate**

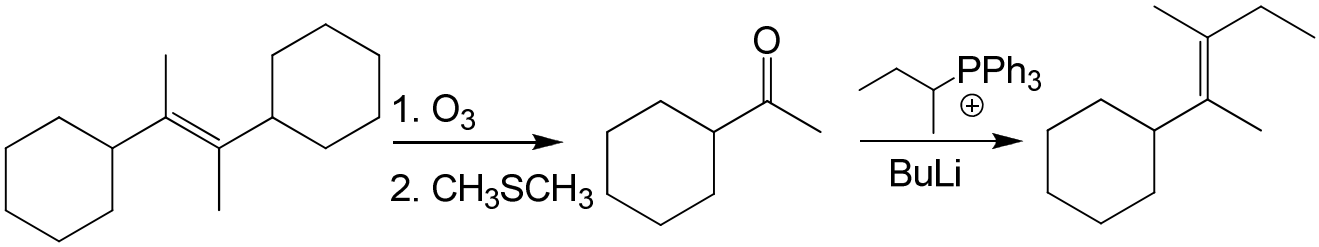
(h)



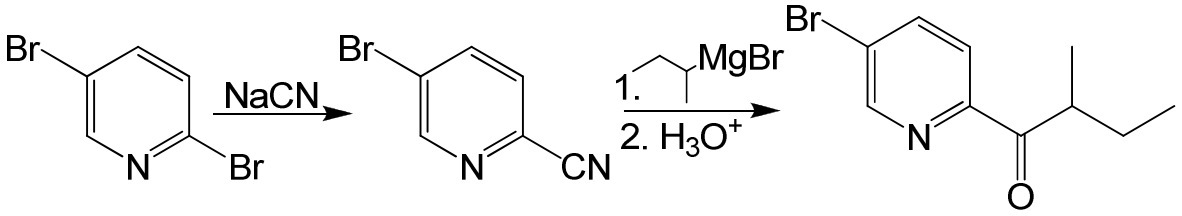
5-amino-2-isobutyl-*N*-isopropyl-6-methyl-4-nitrooctanoic acid lactam

2. Predict the major product(s) expected from the following reactions (3 x 16 = 48 pts)

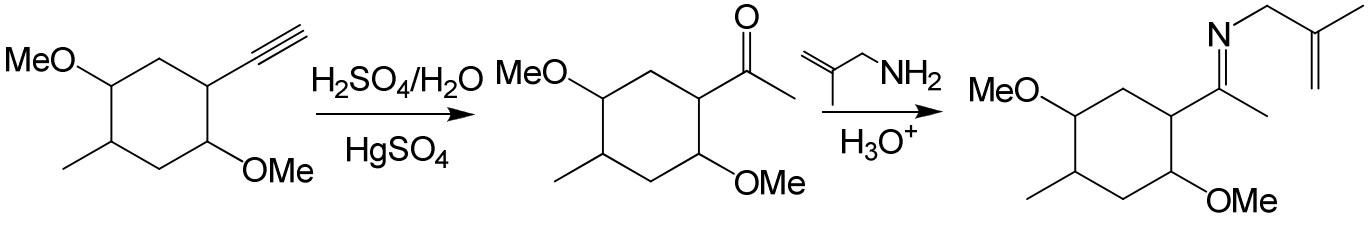
(a)



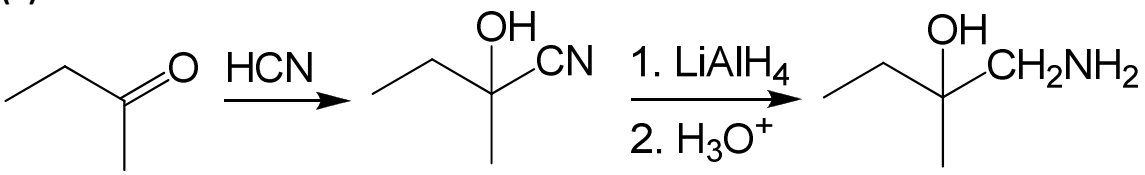
(b)



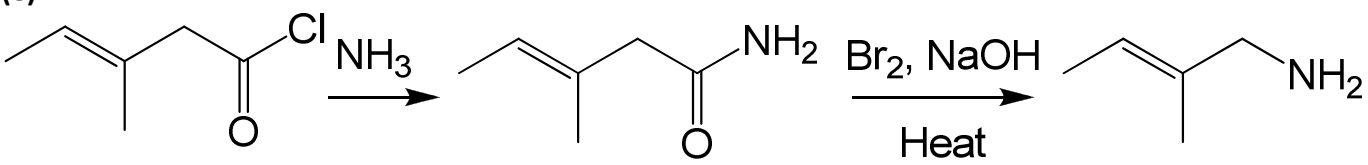
(c)



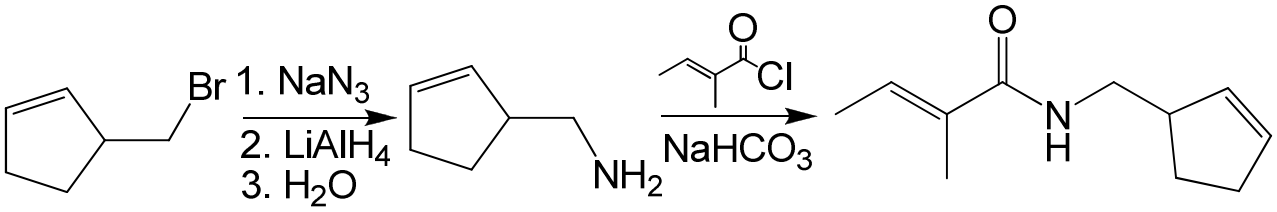
(d)


O
HCN
OH
CN
1. LiAlH4
2. H3O+
OH
CH2NH2

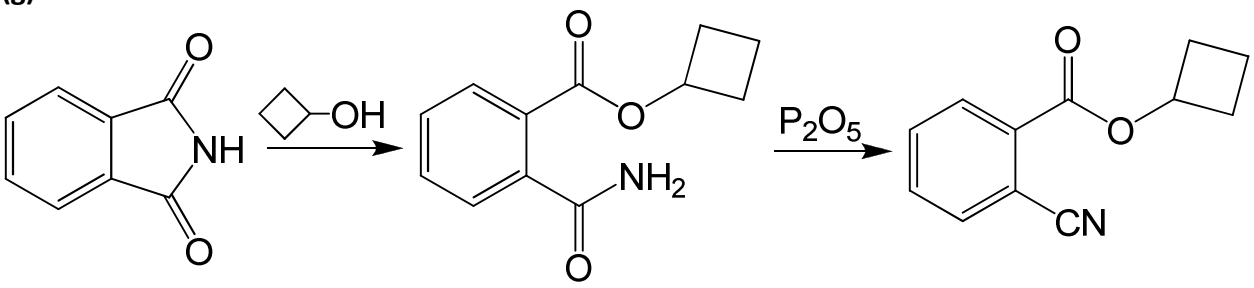
(e)


Cl
O
NH3
NH2
O
Br2, NaOH
Heat
NH2

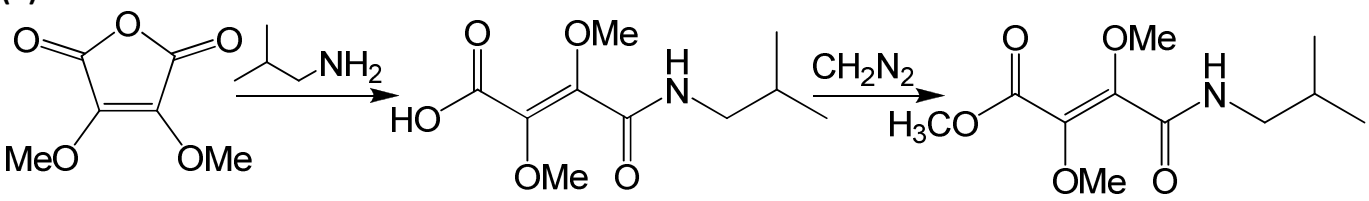
(f)


Br
1. NaN3
2. LiAlH4
3. H2O
NH2
O
Cl
NaHCO3
O
N
H

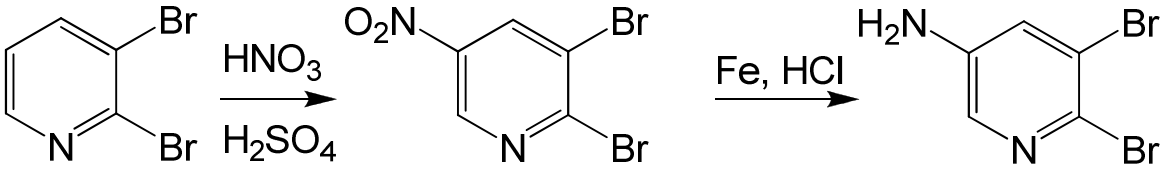
(g)


O
NH
O
OH
O
O
NH2
O
P2O5
O
O
CN

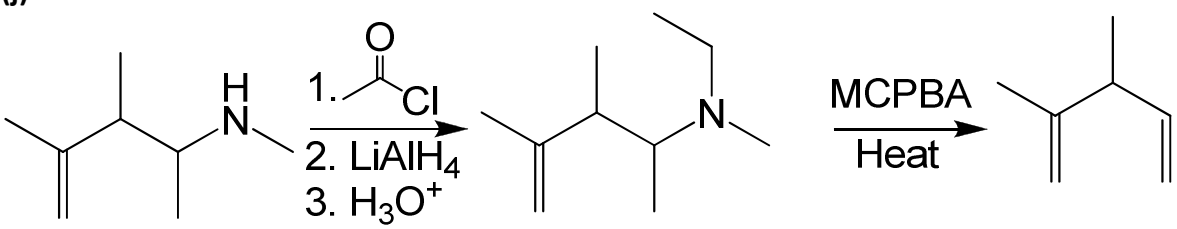
(h)


O
O
O
MeO
OMe
NH2
HO
O
OMe
OMe
O
H
N
CH2N2
H3CO
O
OMe
OMe
O
H
N

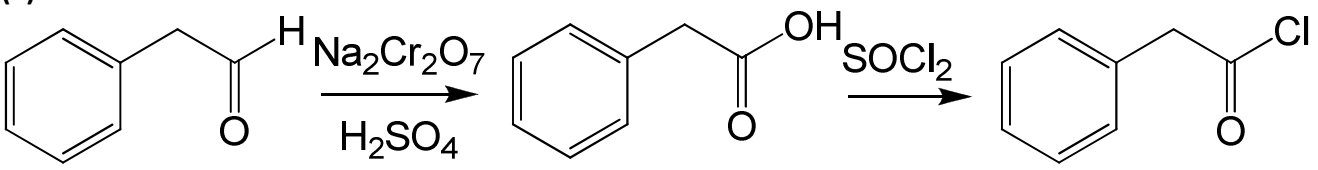
(i)


Br
N
Br
HNO3
H2SO4
O2N
Br
N
Br
Fe, HCl
H2N
Br
N
Br

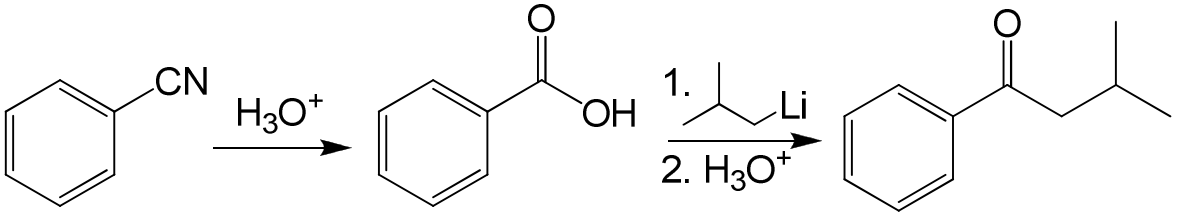
(j)


H
N
O
1.
Cl
2. LiAlH4
3. H3O+
N
MCPBA
Heat

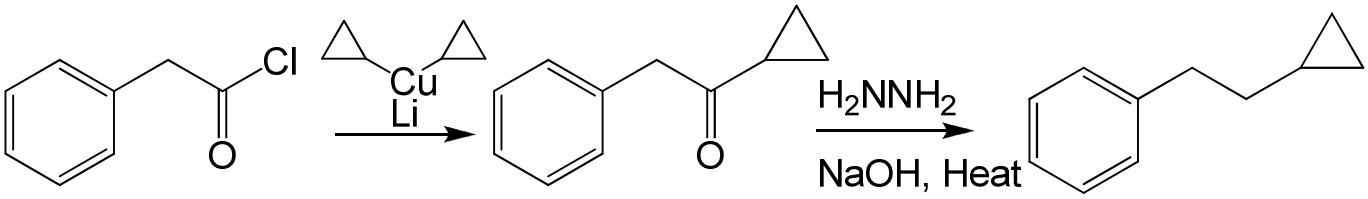
(k)


H
O
$Na_2Cr_2O_7$
H_2SO_4
OH
O
$SOCl_2$
Cl
O

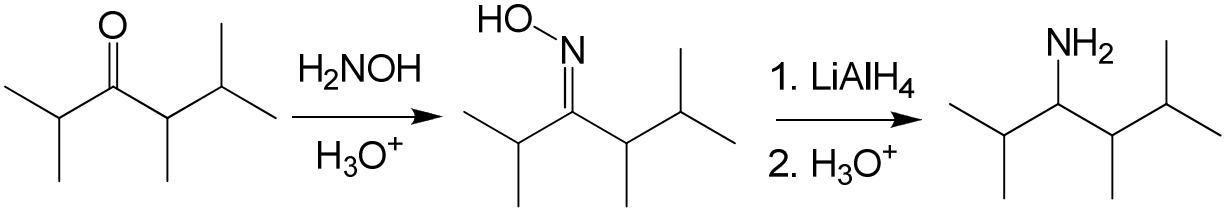
(l)


CN
H_3O^+
O
OH
1.
Li
2. H_3O^+
O

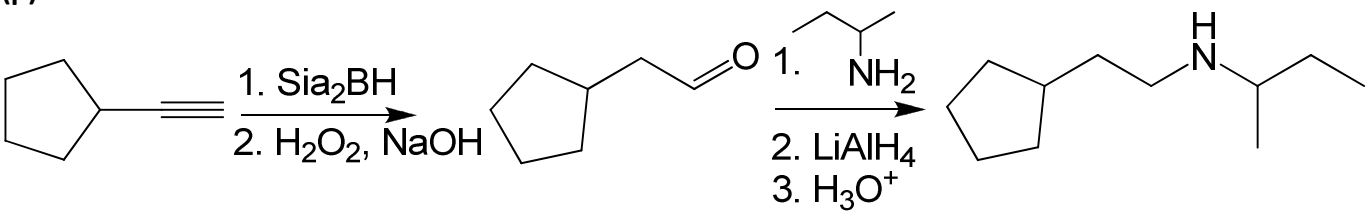
(m)


Cl
O
Cu
Li
O
H_2NNH_2
NaOH, Heat

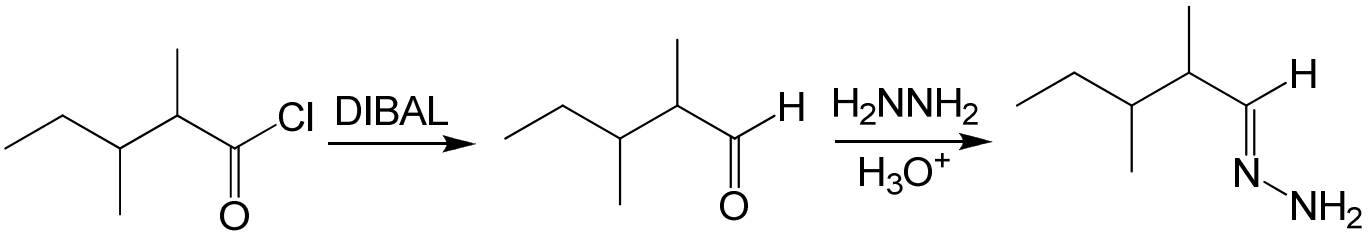
(n)


O
H_2NOH
H_3O^+
HO
N
1. $LiAlH_4$
2. H_3O^+
NH_2

(p)

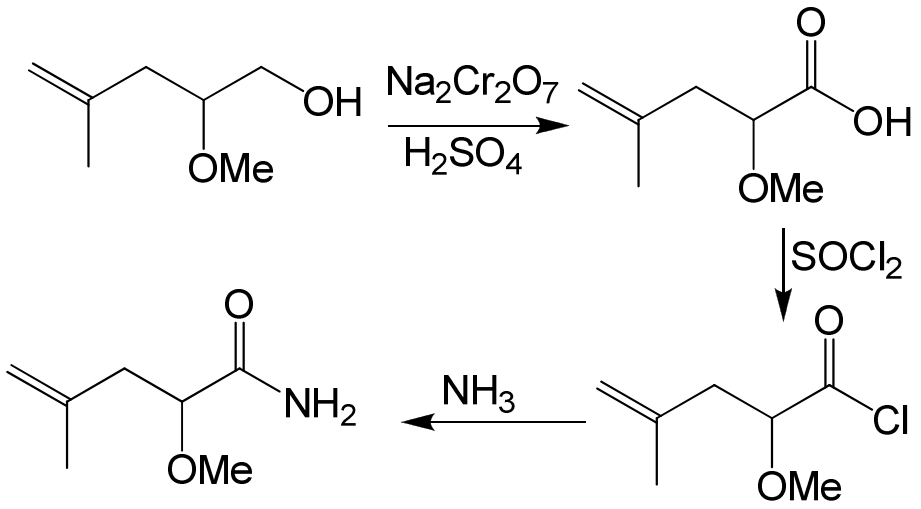

1. Sia_2BH
2. H_2O_2, NaOH
O
1.
NH_2
2. $LiAlH_4$
3. H_3O^+
H
N

(q)

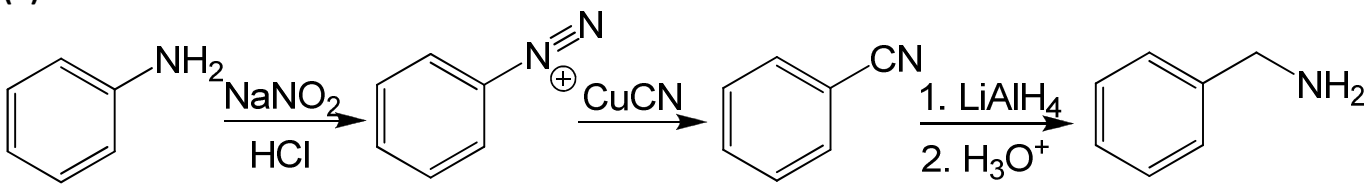

Cl
O
DIBAL
H
O
H_2NNH_2
H_3O^+
H
N
NH_2

3. Show how you would synthesize each of the following compounds from the given starting material(s). **You must show all the intermediates to receive full credit** (3 x 6 = 18 pts)

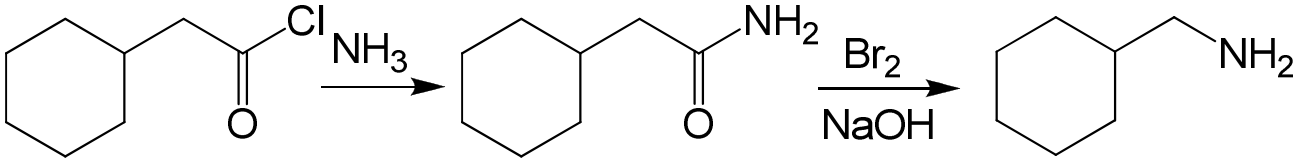
(a)



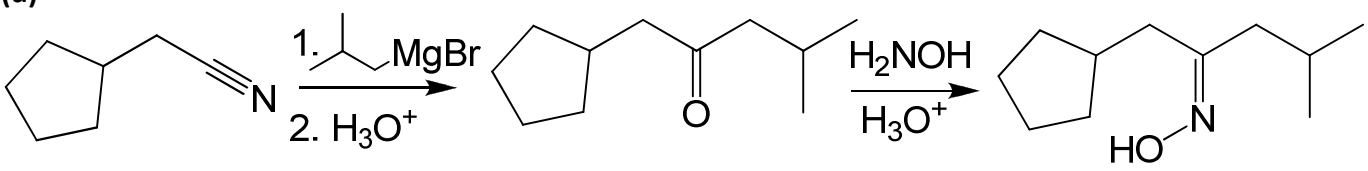
(b)



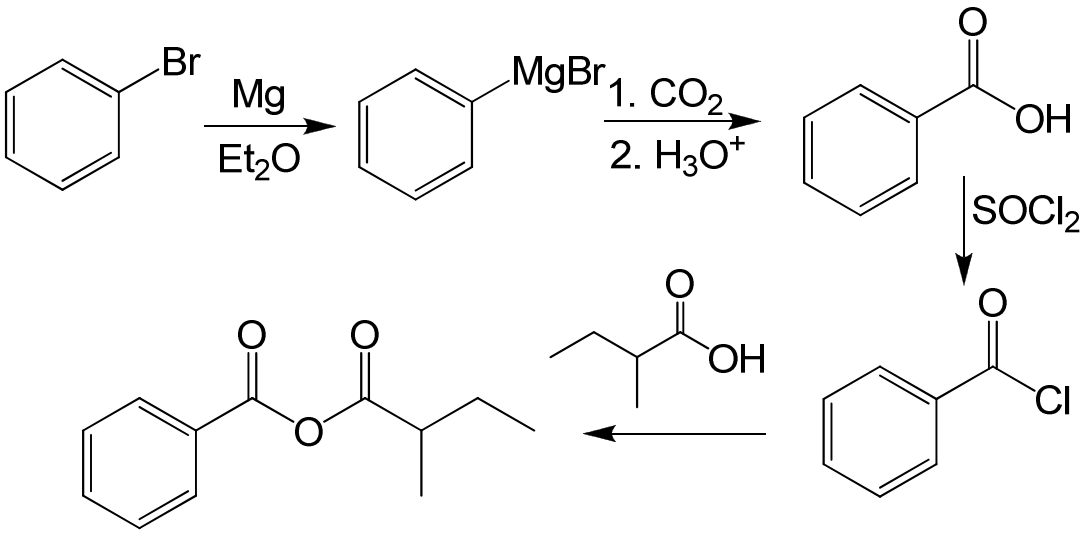
(c)



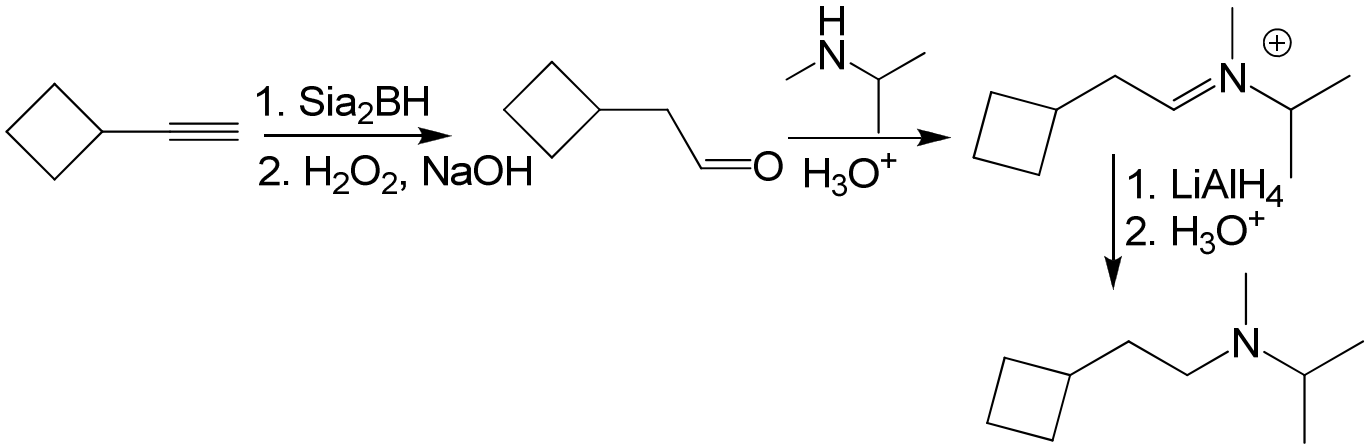
(d)



(e)

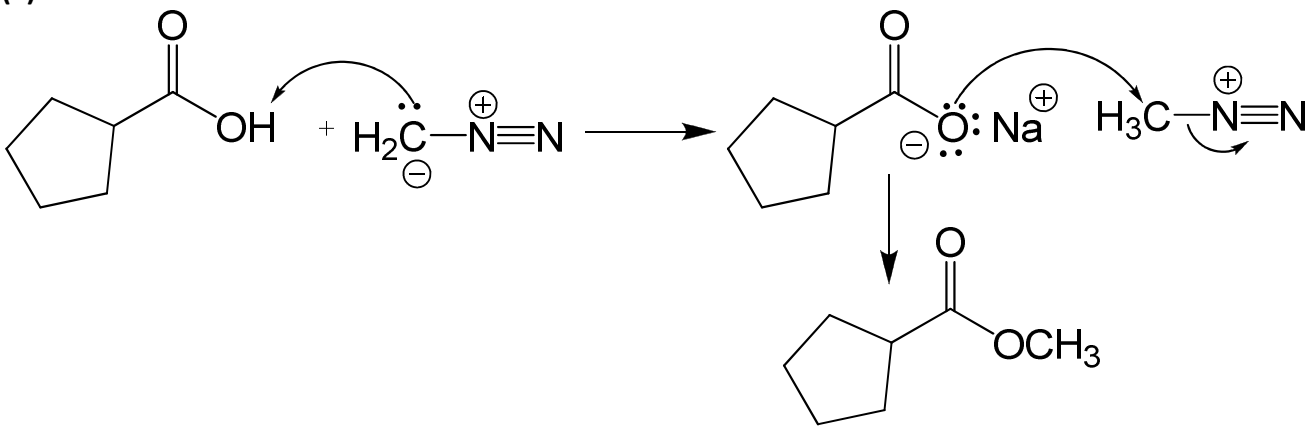


(f)

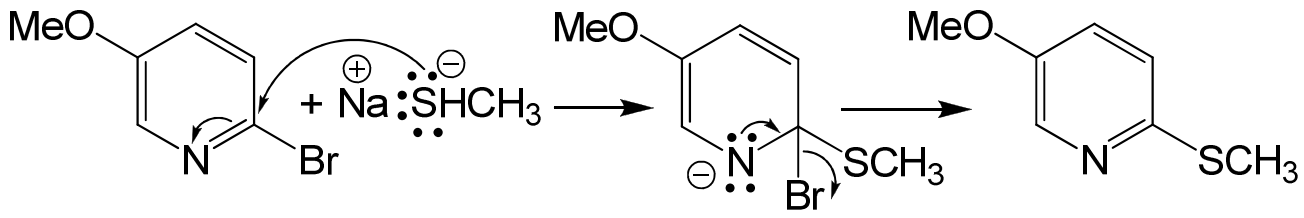


4. Propose a mechanism consistent with the following reactions (**you must show all the intermediates and arrows indicating the electron flow to receive full credit**) (3.5 x 3 = 10.5 pts)

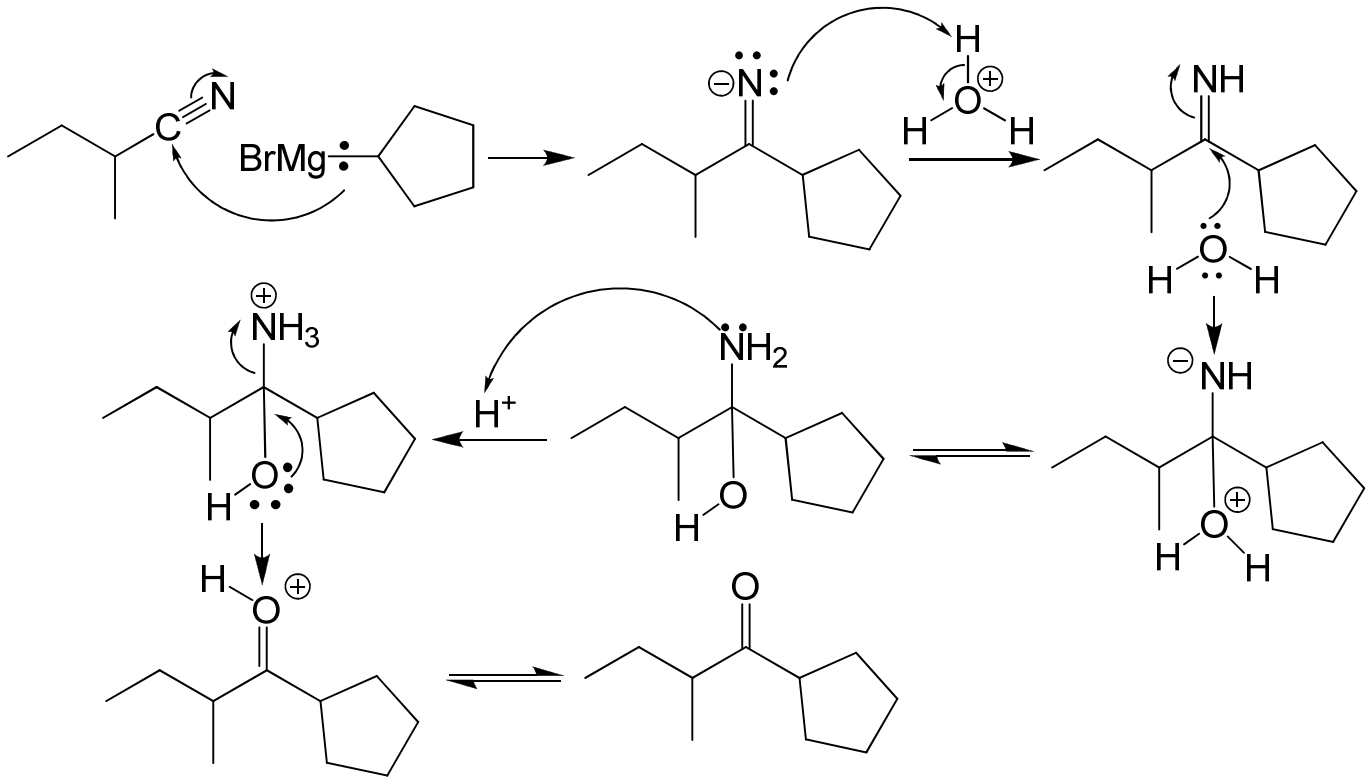
(a)



(b)


MeO
N
Br
+ Na SHCH3
MeO
N
Br
SCH3
MeO
N
SCH3

(c)


N
C
BrMg
N
H
O
H
H
NH
O
H
H
NH
O
H
H
NH2
H+
NH3
O
H
O
H
O