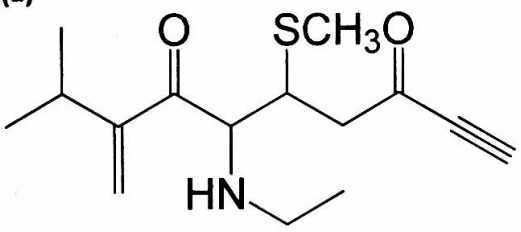
CHEM 266 – Exam-3 **Name**_____
(April 24th, 2017)

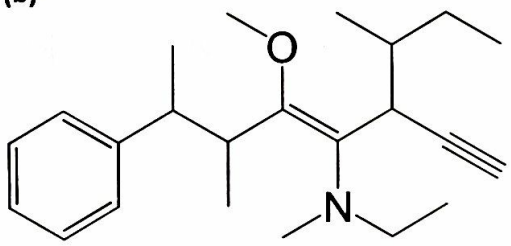
1. Name the following compounds (3 x 8 = 24 pts)

(a)



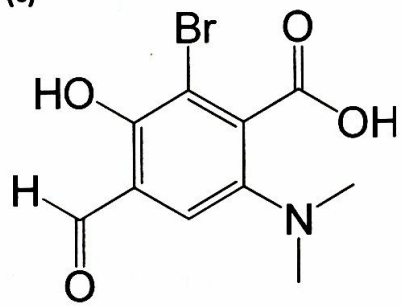
4-amino- *N*-ethyl-2-isopropryl-5-methylthio-non-1-en-8-yne-3,7-dione

(b)



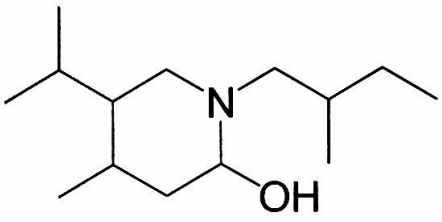
3-*sec*-butyl-N-ethyl-5-methoxy-N, 6-dimethyl-7-phenyloct-4-en-1-yn-4-amine

(c)



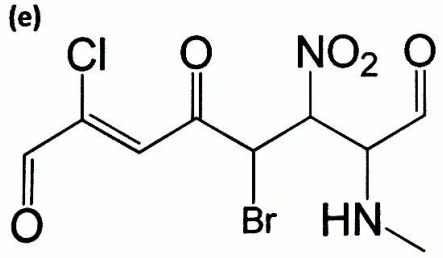
6-amino-2-bromo-4-formyl-3-hydroxy-*N,N*-dimethylbenzoic acid

(d)



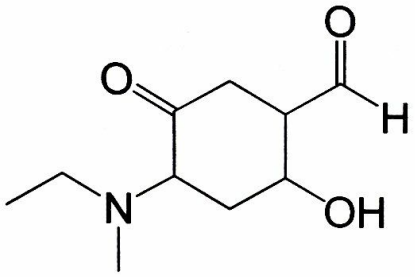
5-isopropyl-4-methyl-*N*-*sec*-pentylpiperidin-2-ol

(e)



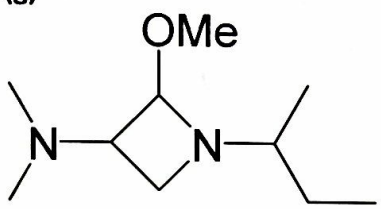
7-amino-5-bromo-2-chloro-*N*-methyl-6-nitro-4-oxooct-2-enedial

(f)



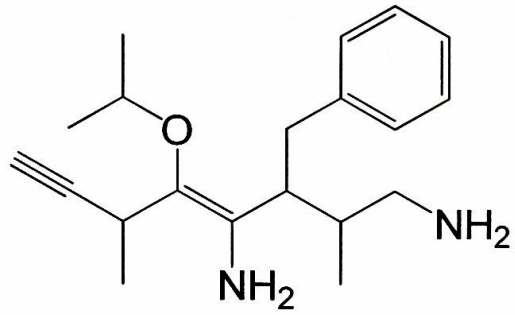
4-amino-N-ethyl-2-hydroxy-N-methyl-5-oxo cyclohexanecarbaldehyde

(g)



1-*sec*-butyl-2-methoxy-N,N-dimethylazetidin-3-amine

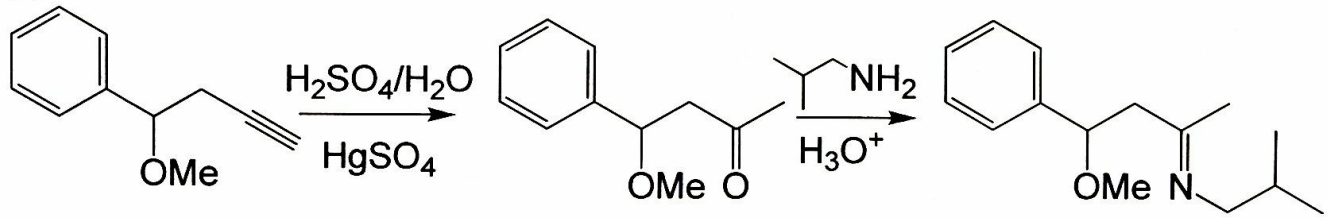
(h)



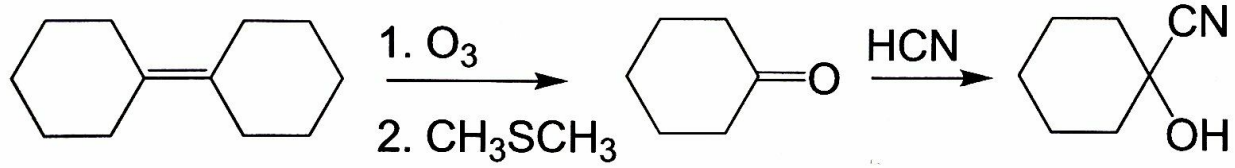
3-benzyl-5-isopropoxy-2,6-dimethyloct-4-en-7-yne-1,4-diamine

2. Predict the major product(s) expected from the following reaction sequences (3 x 15 = 45 pts)

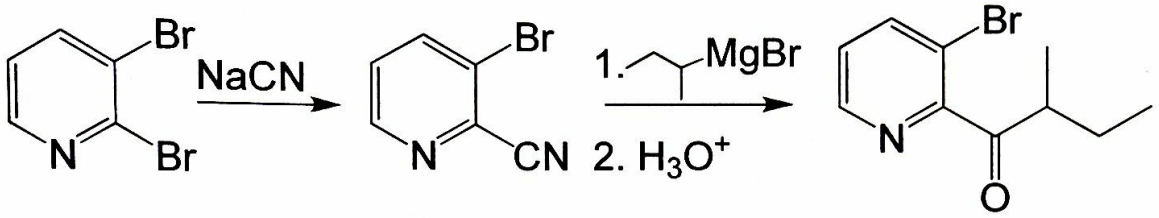
(a)



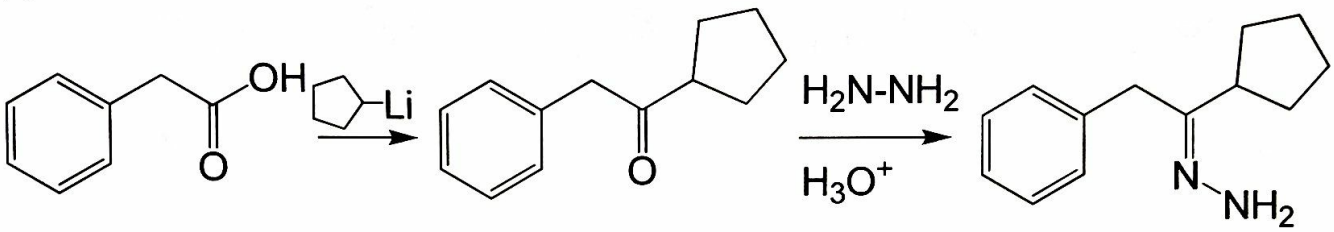
(b)



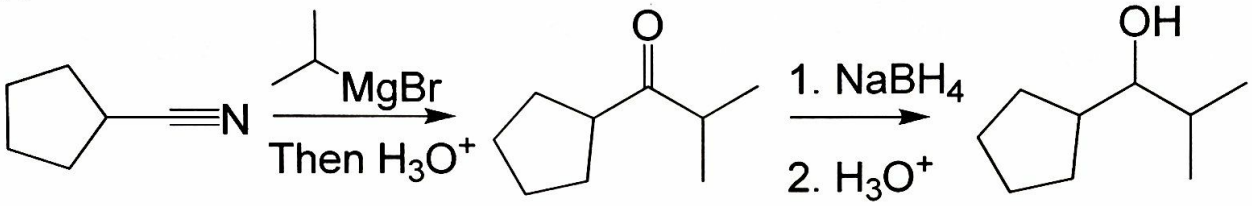
(c)


Br
NaCN
Br
N
Br
CN
1.
MgBr
2. H_3O^+
Br
N
O

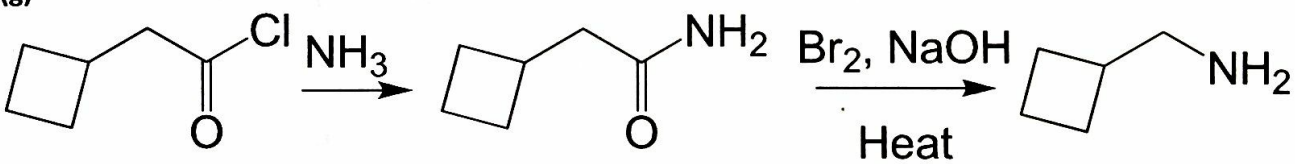
(d)


OH
O
Li
O
H_2N-NH_2
H_3O^+
N
NH_2

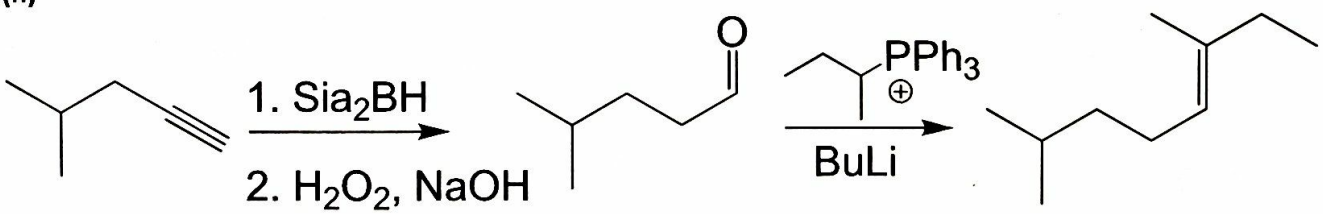
(f)


N
MgBr
Then H_3O^+
O
1. $NaBH_4$
2. H_3O^+
OH

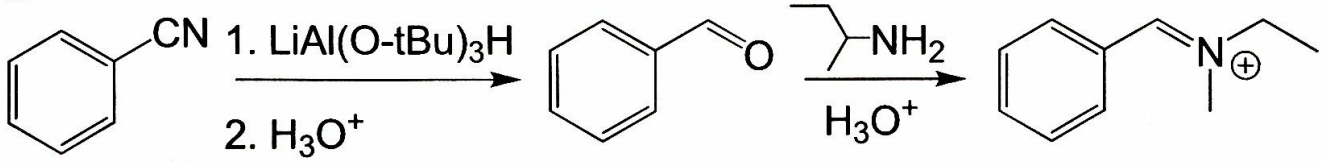
(g)


Cl
O
NH_3
NH_2
O
Br_2, NaOH
Heat
NH_2

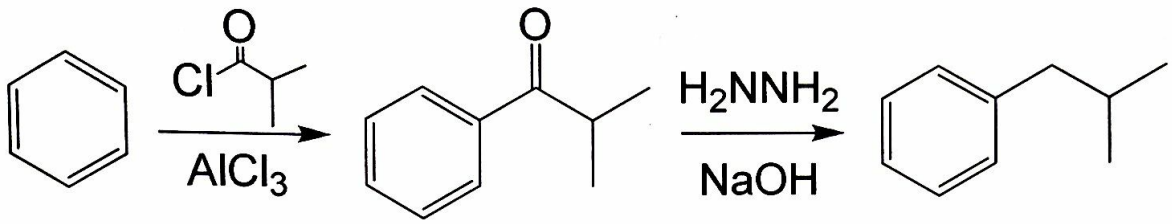
(h)


1. Sia_2BH
2. H_2O_2, NaOH
O
PPh_3
⊕
BuLi

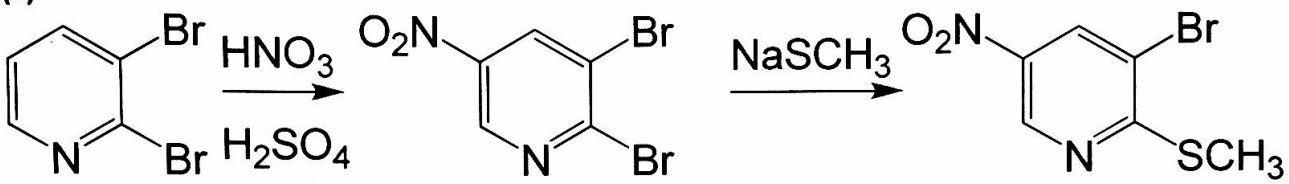
(i)


CN
1. $LiAl(O\text{-}tBu)_3H$
2. H_3O^+
O
NH_2
H_3O^+
N
⊕

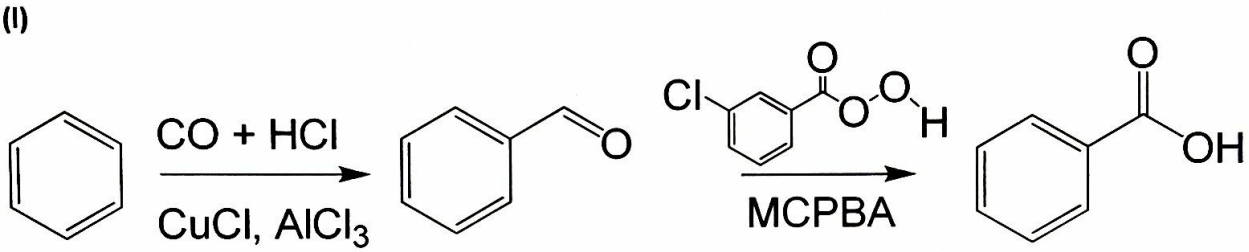
(j)


O
Cl
AlCl3
O
H2NNH2
NaOH

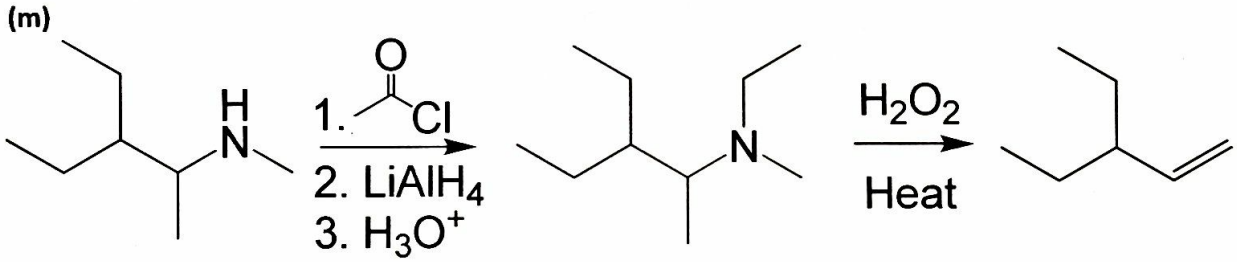
(k)


Br
HNO3
O2N
Br
NaSCH3
O2N
Br
N
Br
H2SO4
N
Br
N
SCH3

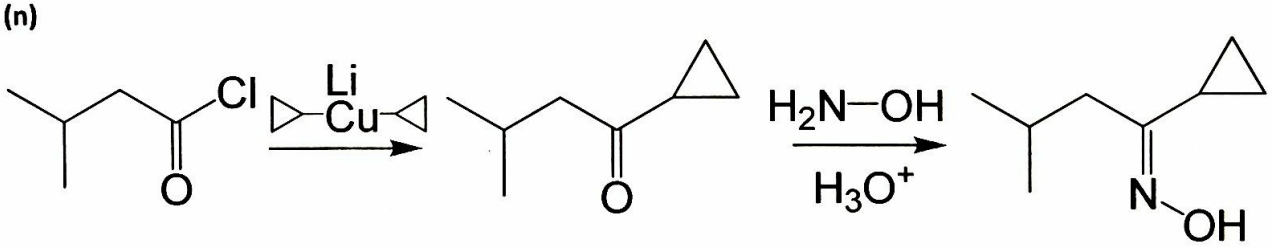
(l)


CO + HCl
CuCl, AlCl3
O
Cl
O
O
H
MCPBA
O
OH

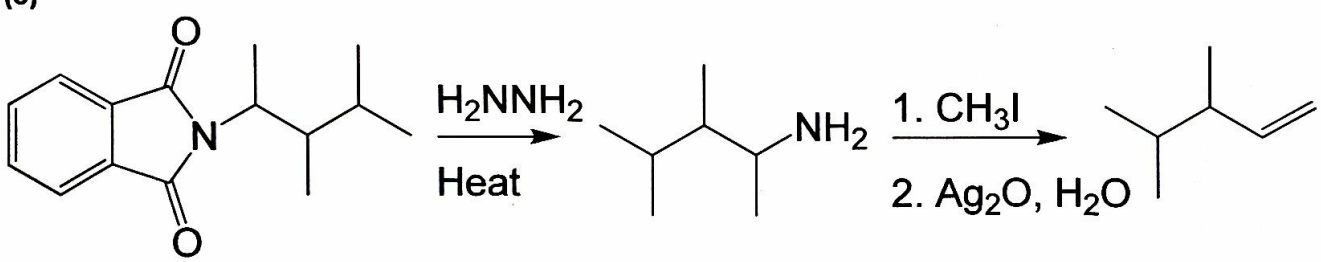
(m)


H
N
O
1.
Cl
2. LiAlH4
3. H3O+
N
H2O2
Heat

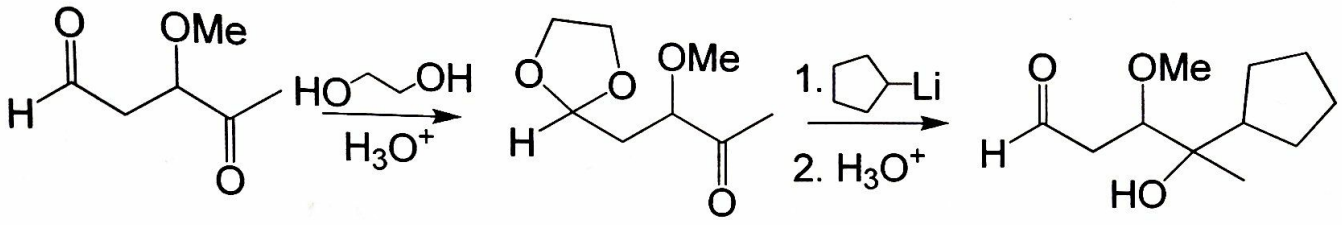
(n)


Cl
O
Li
Cu
O
H2N–OH
H3O+
N
OH

(o)

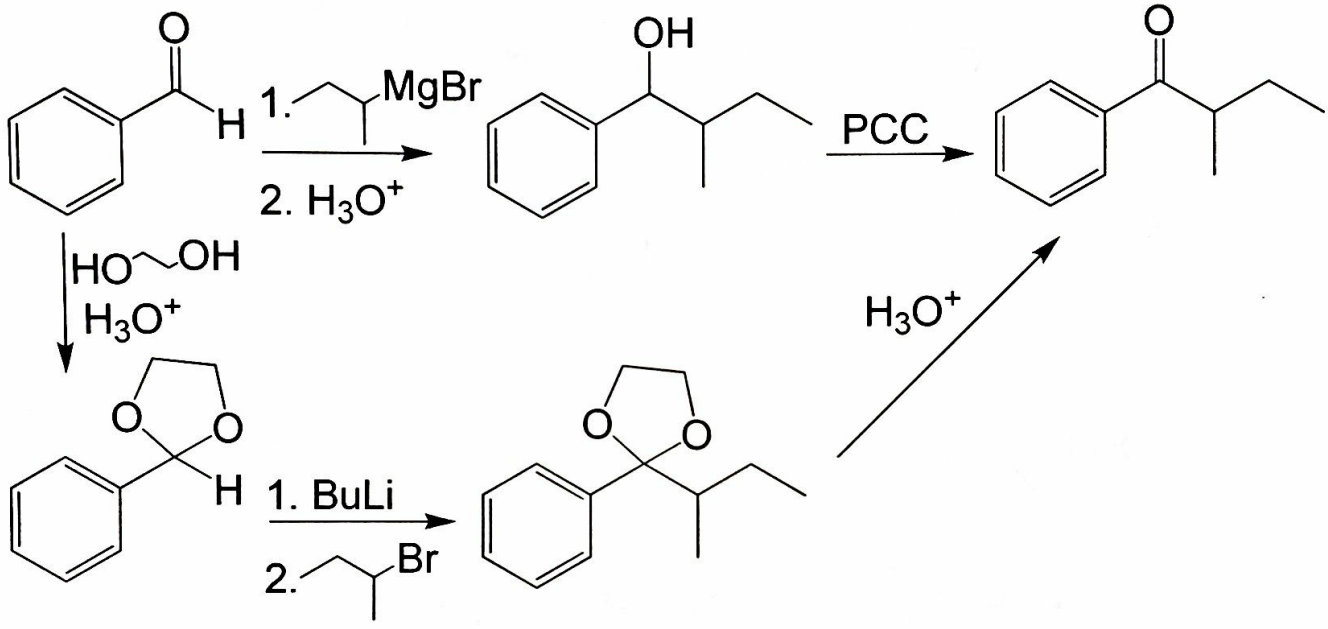

O
N
O
H2NNH2
Heat
NH2
1. CH3I
2. Ag2O, H2O

(p)

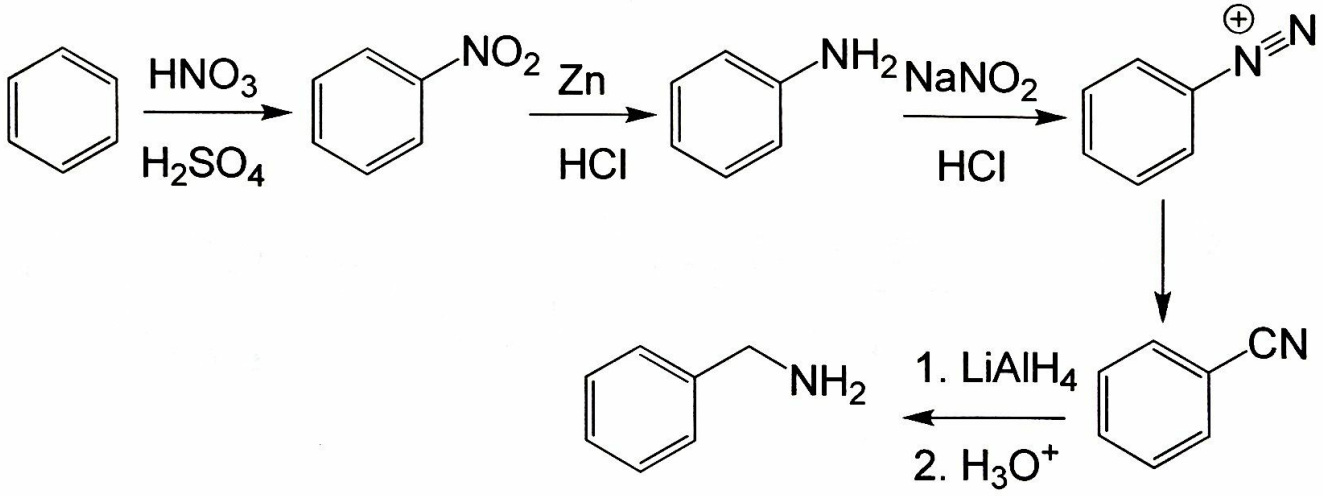


3. Show how you would synthesize each of the following compounds from the given starting material(s). You must draw keys intermediates to receive full credit (3.25 x 6 = 19.5 pts)

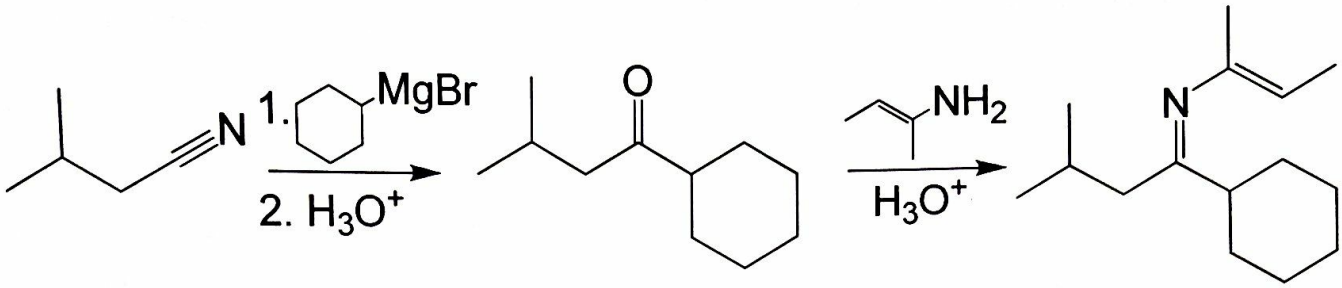
(a) Two possible ways



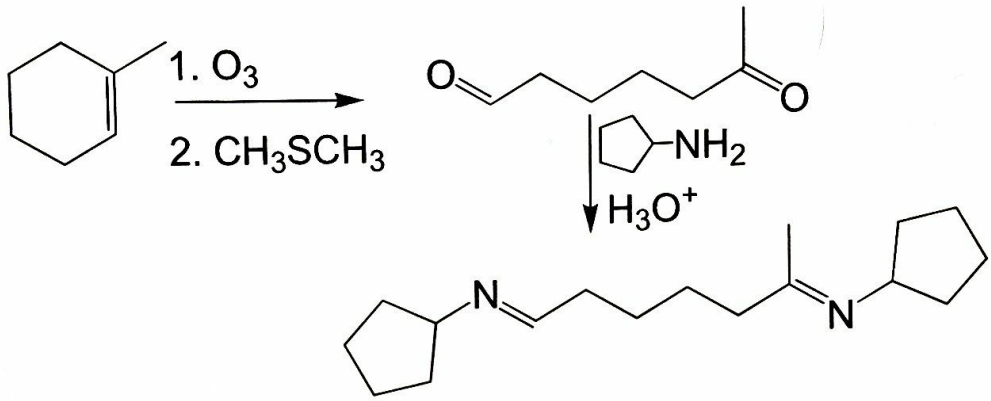
(b)



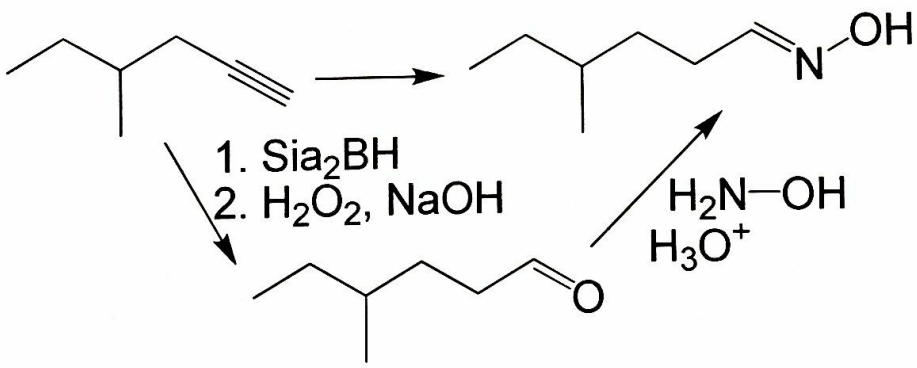
(c)


N
1.
MgBr
2. H_3O^+
O
NH_2
H_3O^+
N

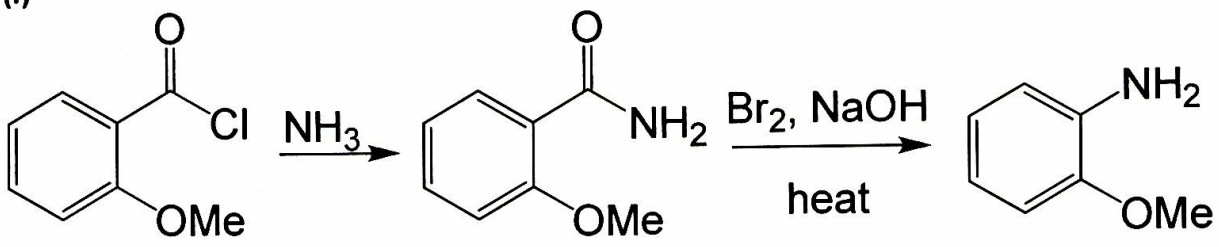
(d)


1. O_3
2. CH_3SCH_3
O
O
NH_2
H_3O^+
N
N

(e)

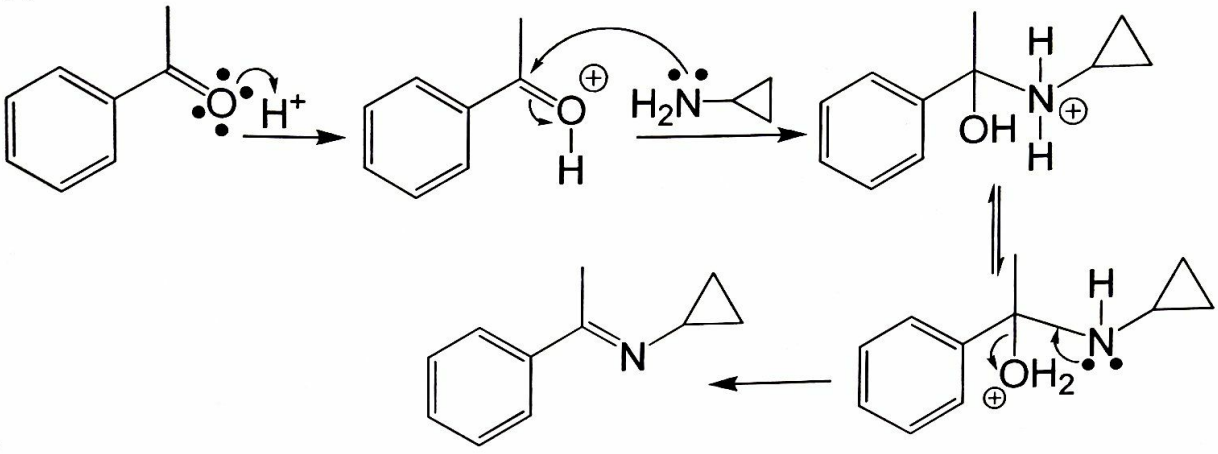

1. Sia_2BH
2. H_2O_2, NaOH
H_2N–OH
H_3O^+
N
OH
O

(f)

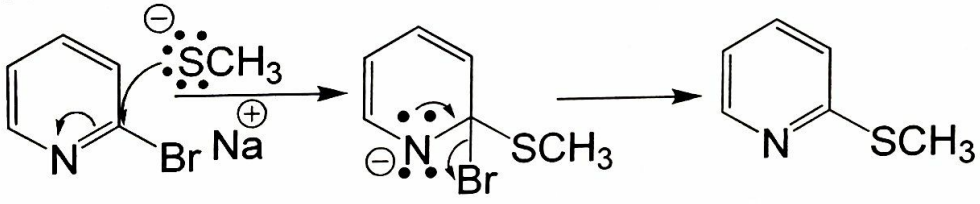

O
Cl
OMe
NH_3
O
NH_2
OMe
Br_2, NaOH
heat
NH_2
OMe

4. Propose a mechanism consistent with the following reactions (you must show all the intermediates to receive full credit) (4 x 3 = 12 pts)

(a)



(b)



(c)