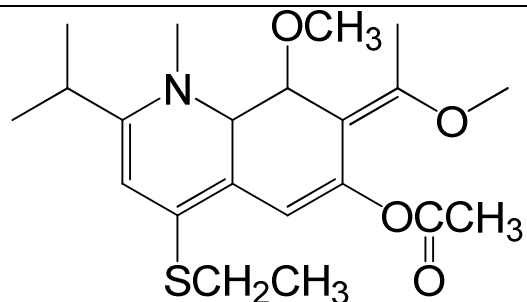
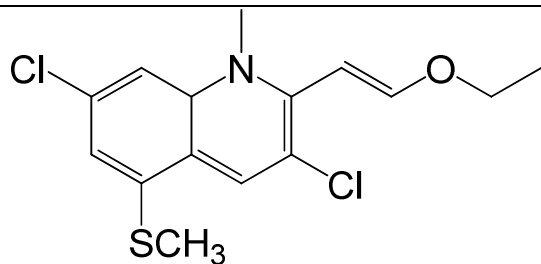
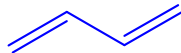
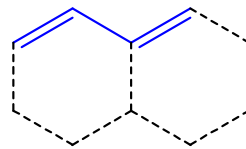
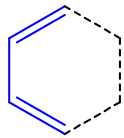


Spring 2017 (March 22)

1. Use the Woodward-Fieser table to estimate the  $\lambda_{\text{max}}$  observed in a UV spectra of the following cross-conjugated systems (6 pts)

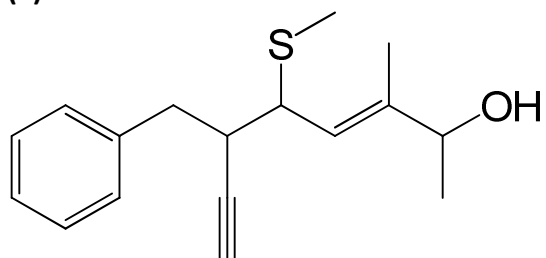


Acyclic 	<b>217 nm</b>
Heteroannular 	<b>214 nm</b>
Homoannular 	<b>253 nm</b>

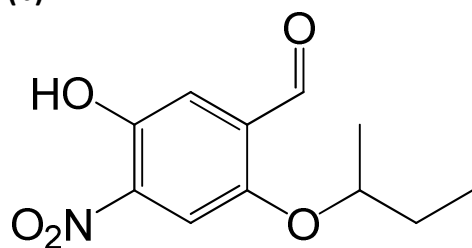
For each additional conjugated double bond	<b>+ 30 nm</b>
For each exocyclic double bond	<b>+ 5 nm</b>
For each substituent	
C-substituent	<b>+ 5 nm</b>
Cl	<b>+ 5 nm</b>
Br	<b>+ 5 nm</b>
O-Alkyl	<b>+ 6 nm</b>
OCOCH <sub>3</sub>	<b>+ 0 nm</b>
N(alkyl) <sub>2</sub>	<b>+ 60 nm</b>
S-alkyl	<b>+ 30 nm</b>
Solvent correction	<b>+ 0 nm</b>

2. Name the following compounds (3 x 6 = 18 pts)

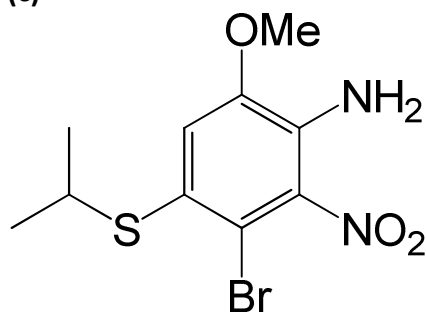
(a)



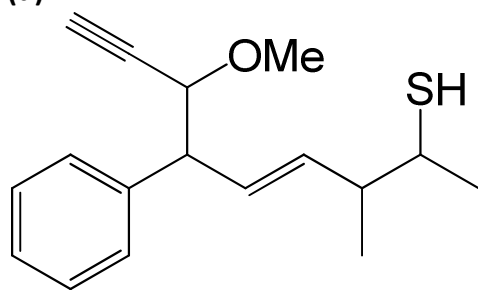
(b)



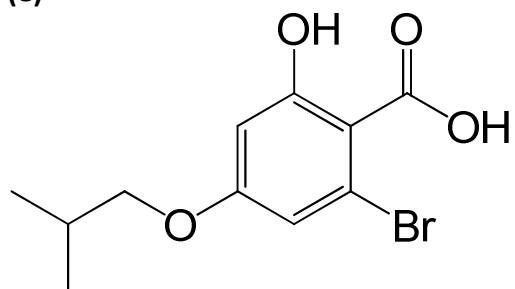
(c)



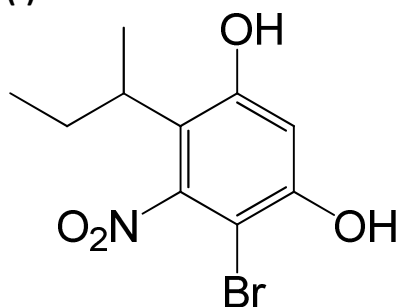
(d)



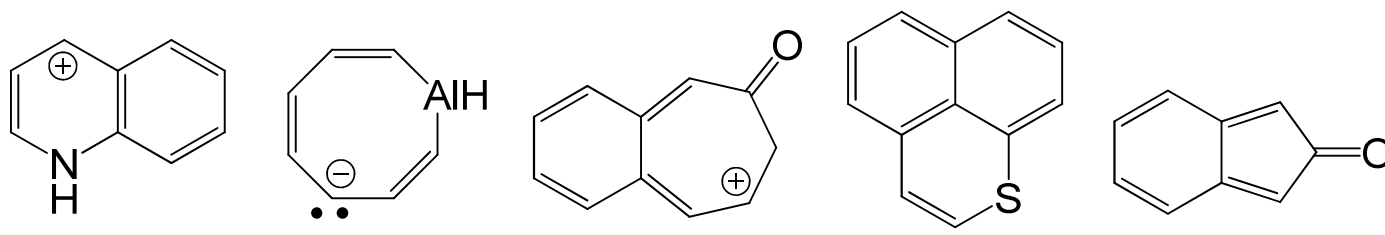
(e)



(f)

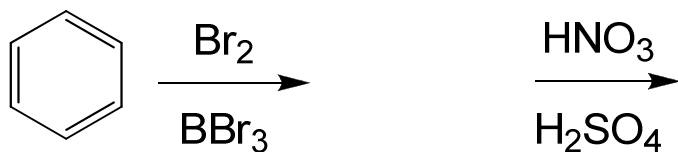


3. Classify the following molecules as aromatic, anti-aromatic or non-aromatic (5 pts)

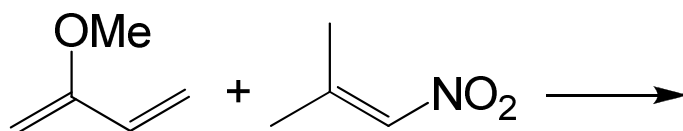


4. Predict the major product(s) expected from the following reaction sequences (3 x 14 = 42 pts)

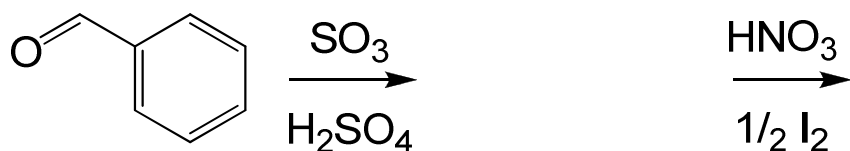
(a)



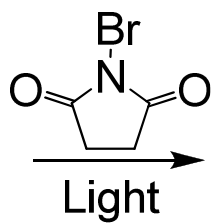
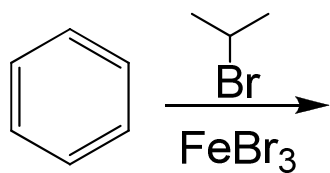
(b)



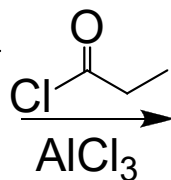
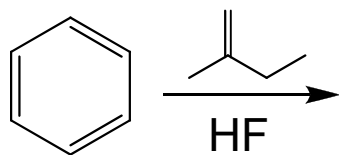
(c)



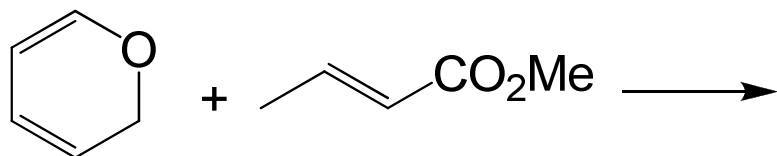
(d)



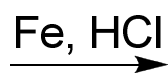
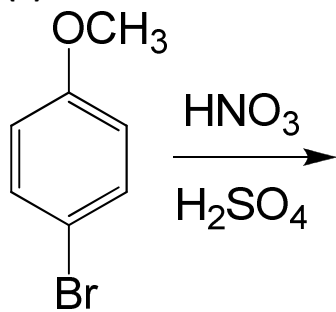
(f)



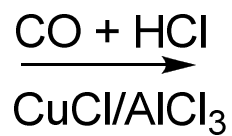
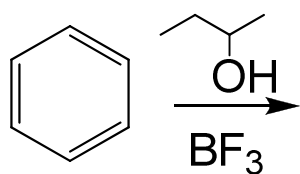
(g)



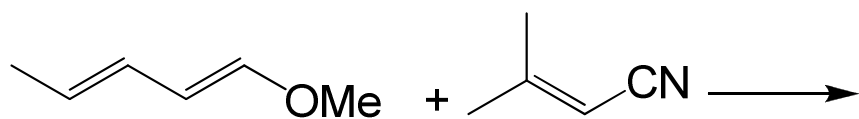
(h)



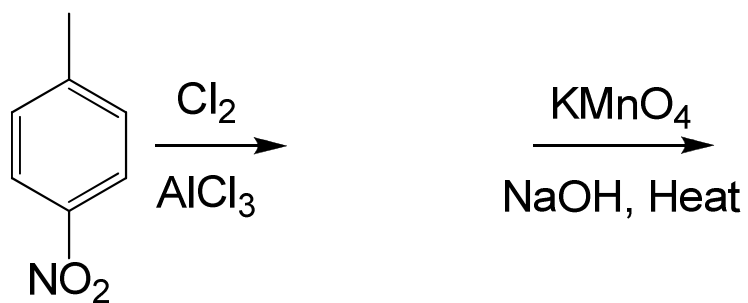
(i)



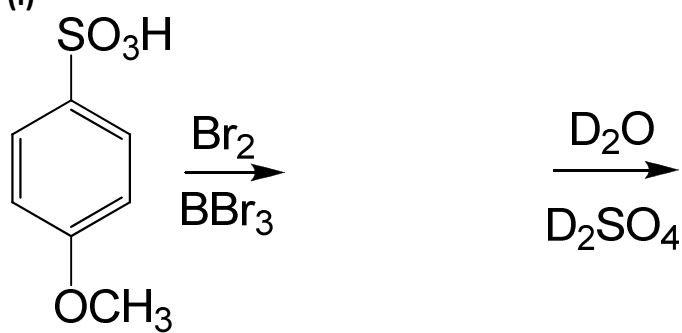
(j)



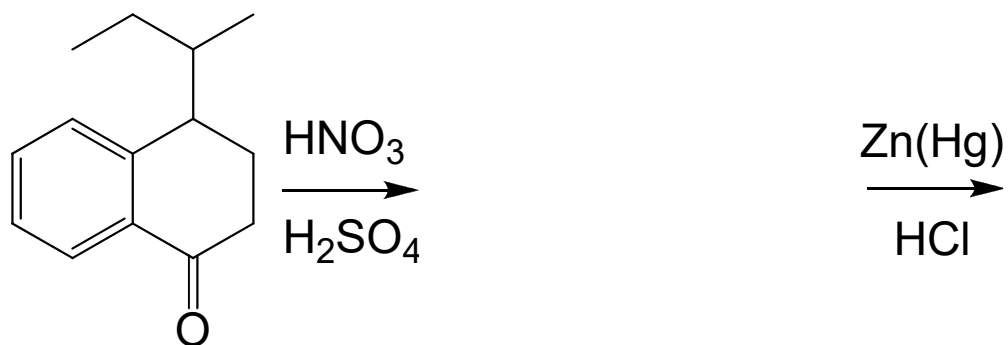
(k)



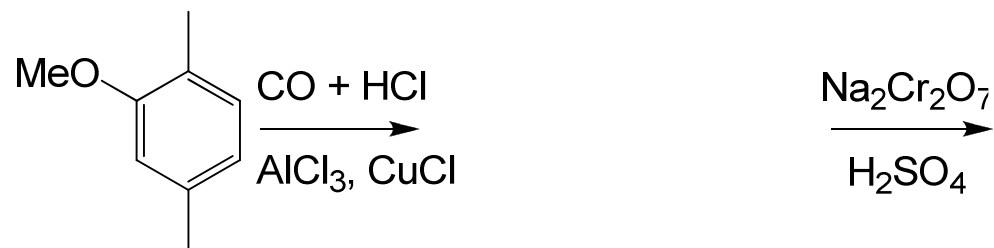
(l)



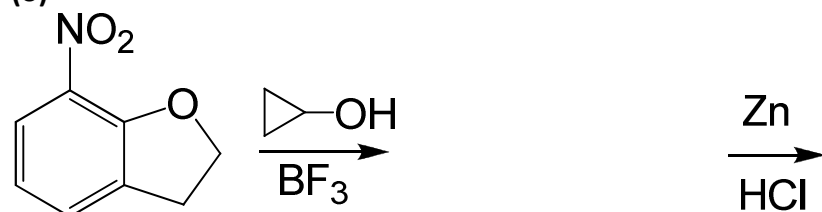
(m)



(n)

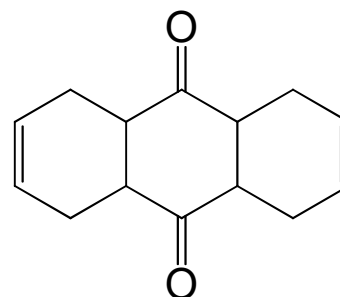
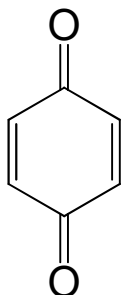


(o)

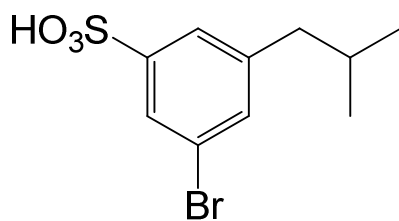
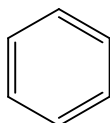


5. Show how you would synthesize each of the following compounds from the given starting material(s). You must draw keys intermediates to receive full credit (3 x 6 = 18 pts)

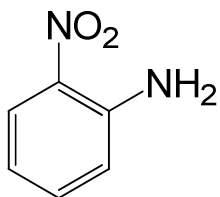
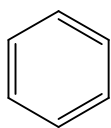
(a)



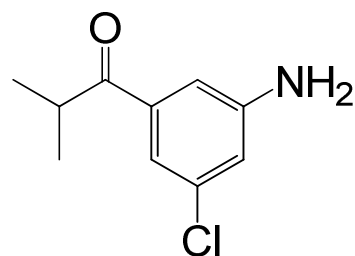
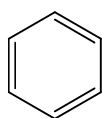
(b)



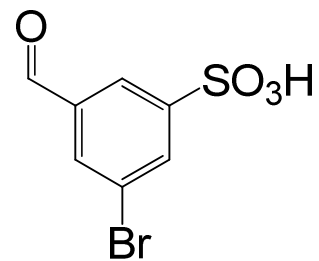
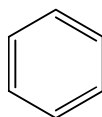
(c)



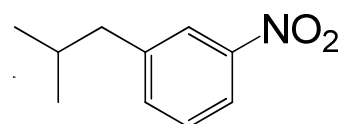
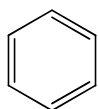
(d)



(e)

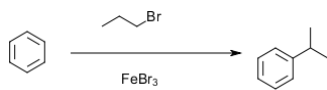


(f)

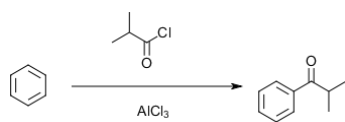


6. Propose a mechanism consistent with the following reactions (you must show all the intermediates to receive full credit) (3 x 3 = 9 pts)

(a)



(b)



(c)

