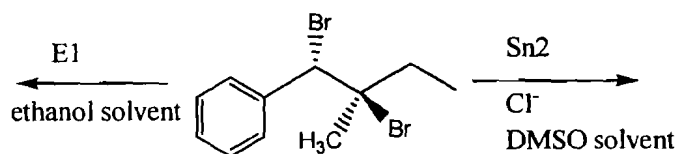


Chem 242 Final practice exam (w09)

1. a)(12 pts) For the dibromide shown below draw the respective products for the Sn2 and E1 mechanisms. Be sure to depict the appropriate stereochemistry.

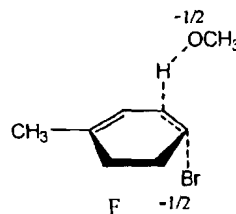
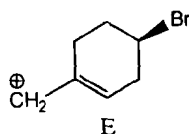
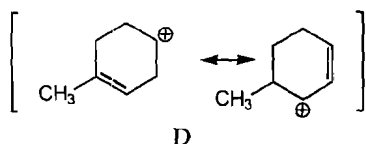
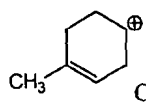
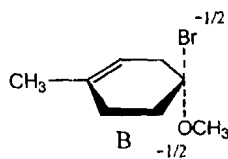
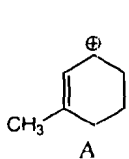
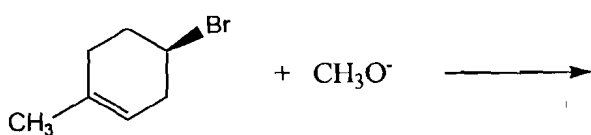
Draw the appropriate reaction coordinate diagram for each.



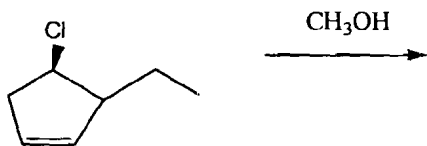
2. (6 pts) For the reaction below, identify which structure (A-F) would be the **transition state** for:

The Sn2 mechanism: _____

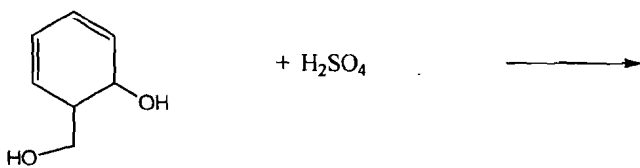
The E2 mechanism: _____



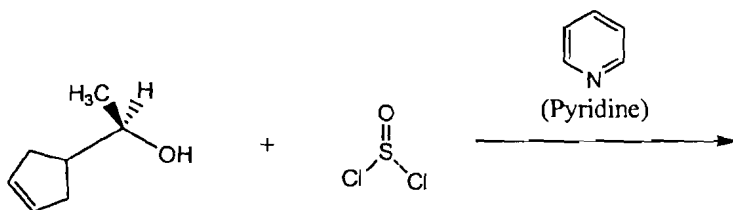
3. (24 pts – 8 pts each) For the reactions below, state if the mechanism is Sn1, Sn2, E2, E1 or an alcohol dehydration and draw the major organic product(s) produced by this mechanism. Be sure to show the pertinent stereochemistry for the product(s).



Type of mechanism _____

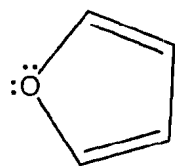


Type of mechanism _____



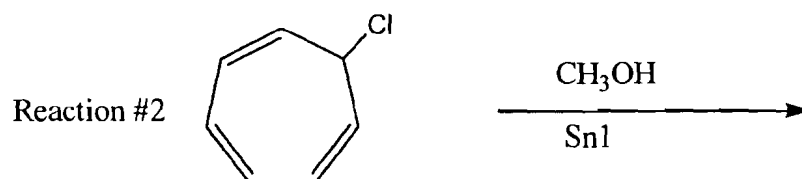
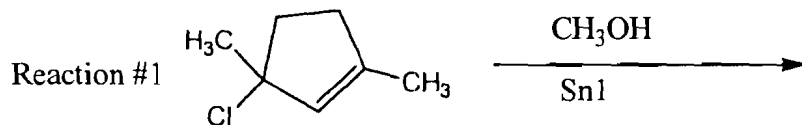
Type of mechanism _____

4. (6 pts) Draw as clearly as you can a 3-D depiction of furan (shown below). Draw in the location of all the p orbitals and lone pair electrons. This drawing should show how all the 'aromatic electrons' are in conjugation.



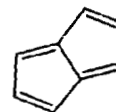
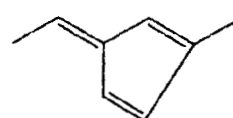
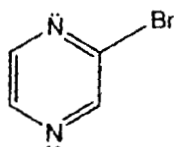
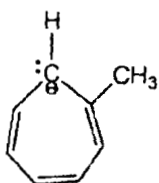
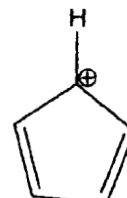
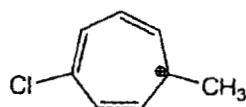
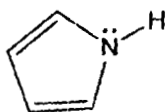
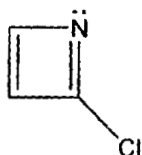
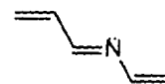
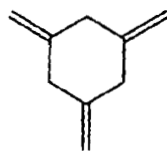
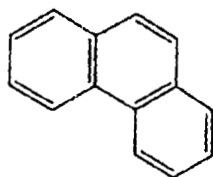
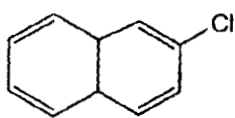
5. The 2 alkyl chlorides below undergo an S_N1 reaction with methanol. Reaction #2 is 100 times faster than reaction #1.

a)(4 pts ea) Depict the major organic product for each reaction.

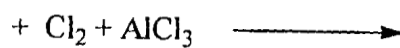
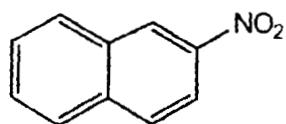


b) (5 pts) Briefly explain why reaction #2 is faster than reaction #1

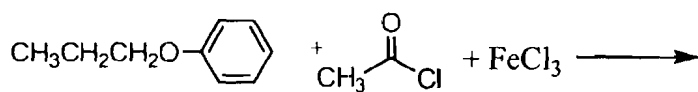
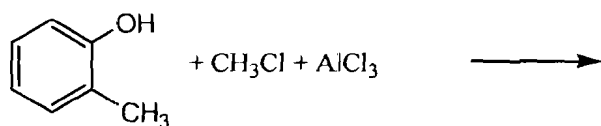
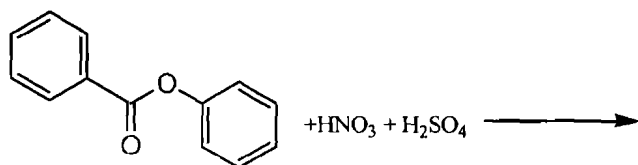
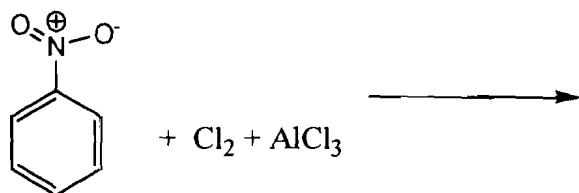
6. a)(8 pts) Circle the structures below which are **aromatic**.
 b)(8 pts) Underline the structures which are **anti-aromatic**.



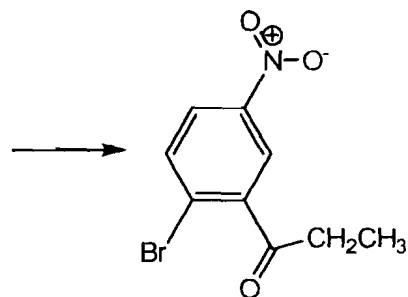
7. (6 pts) Draw all *possible* mono chlorination products for the aromatic compound shown below.



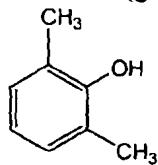
8. (5 pts each) Fill in the major organic product(s) for the reactions below



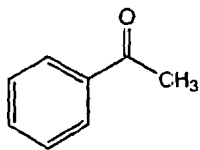
9. (8 pts) Starting from Benzene, synthesize the following compound (use electrophilic aromatic substitution reactions).



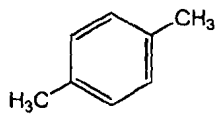
10. The 3 compounds below all undergo an Electrophilic aromatic substitution reaction with Br^+ (generated from Br_2 and FeBr_3 .)



#1



#2



#3

a) (3 pts) Underline the compound that would react the slowest.

b) (4 pts) **Circle** the compound that would react the fastest

c) (10 pts) Draw the **product and mechanism** for fastest reaction (the circled compound only). Show all pertinent resonance structures of the intermediate.

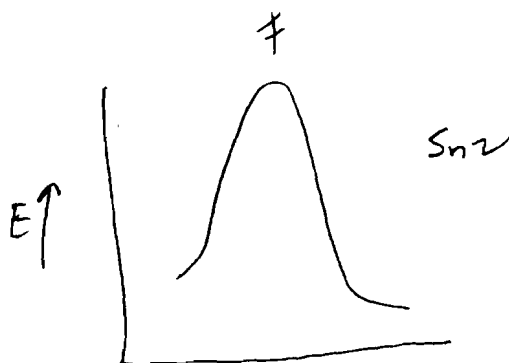
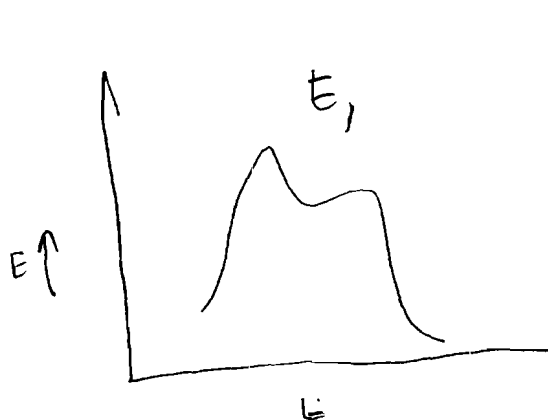
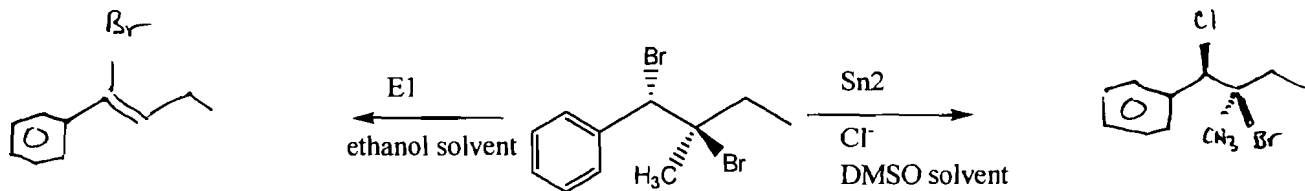
Extra credit. What would be a clever bumper sticker for Organic chemistry

Chem 242 Final practice exam (w09)

Key

1. a)(12 pts) For the dibromide shown below draw the respective products for the Sn2 and E1 mechanisms. Be sure to depict the appropriate stereochemistry.

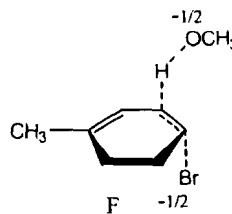
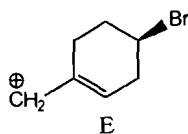
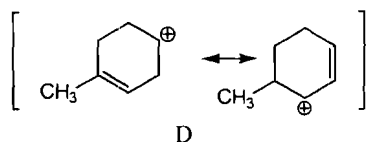
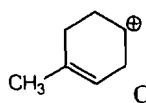
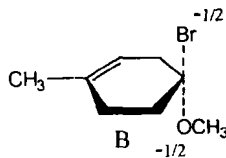
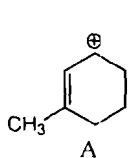
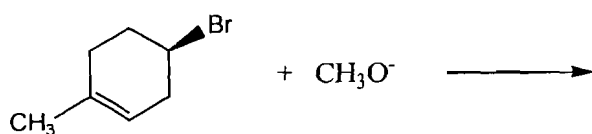
Draw the appropriate reaction coordinate diagram for each.



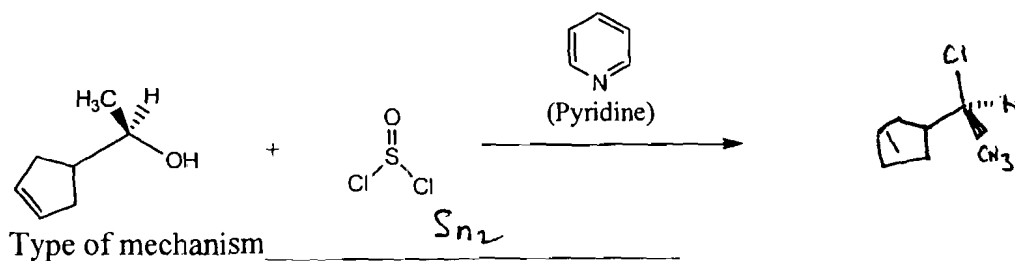
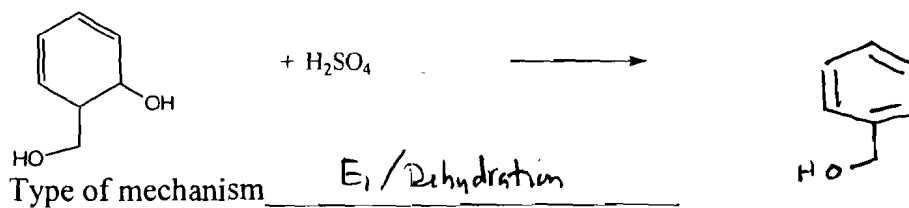
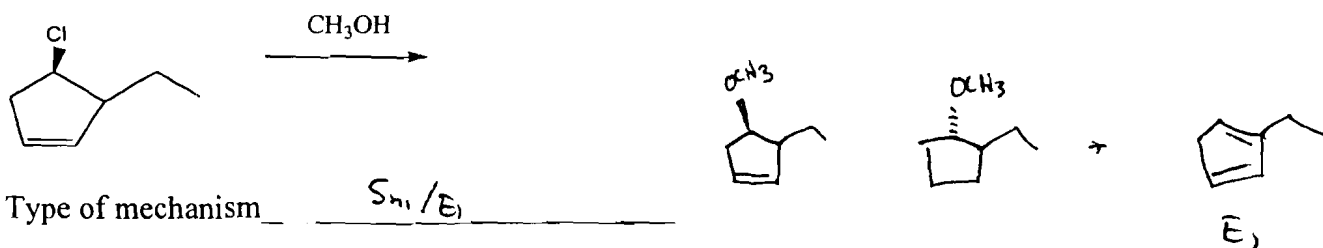
2. (6 pts) For the reaction below, identify which structure (A-F) would be the **transition state** for:

The Sn2 mechanism: B

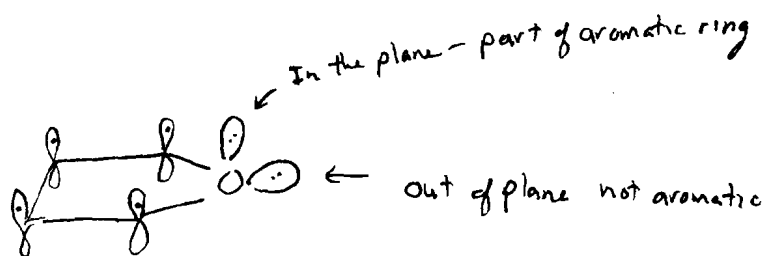
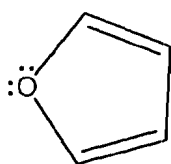
The E2 mechanism: F



3. (24 pts – 8 pts each) For the reactions below, state if the mechanism is **Sn1**, **Sn2**, **E2**, **E1** or an alcohol dehydration and draw the major organic product(s) produced by this mechanism. Be sure to show the pertinent stereochemistry for the product(s).

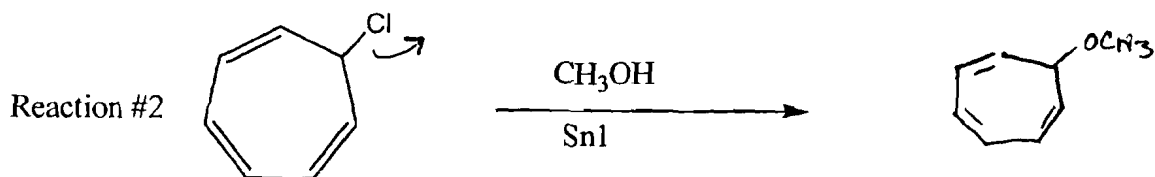
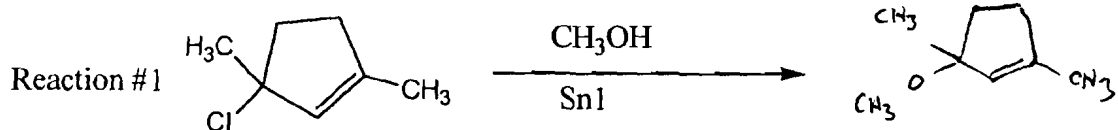


4. (6 pts) Draw as clearly as you can a 3-D depiction of furan (shown below). Draw in the location of all the p orbitals and lone pair electrons. This drawing should show how all the 'aromatic electrons' are in conjugation.



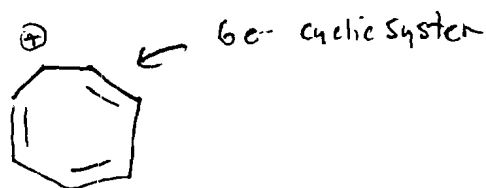
5. The 2 alkyl chlorides below undergo an S_N1 reaction with methanol. Reaction #2 is 100 times faster than reaction #1.

a) (4 pts ea) Depict the major organic product for each reaction.



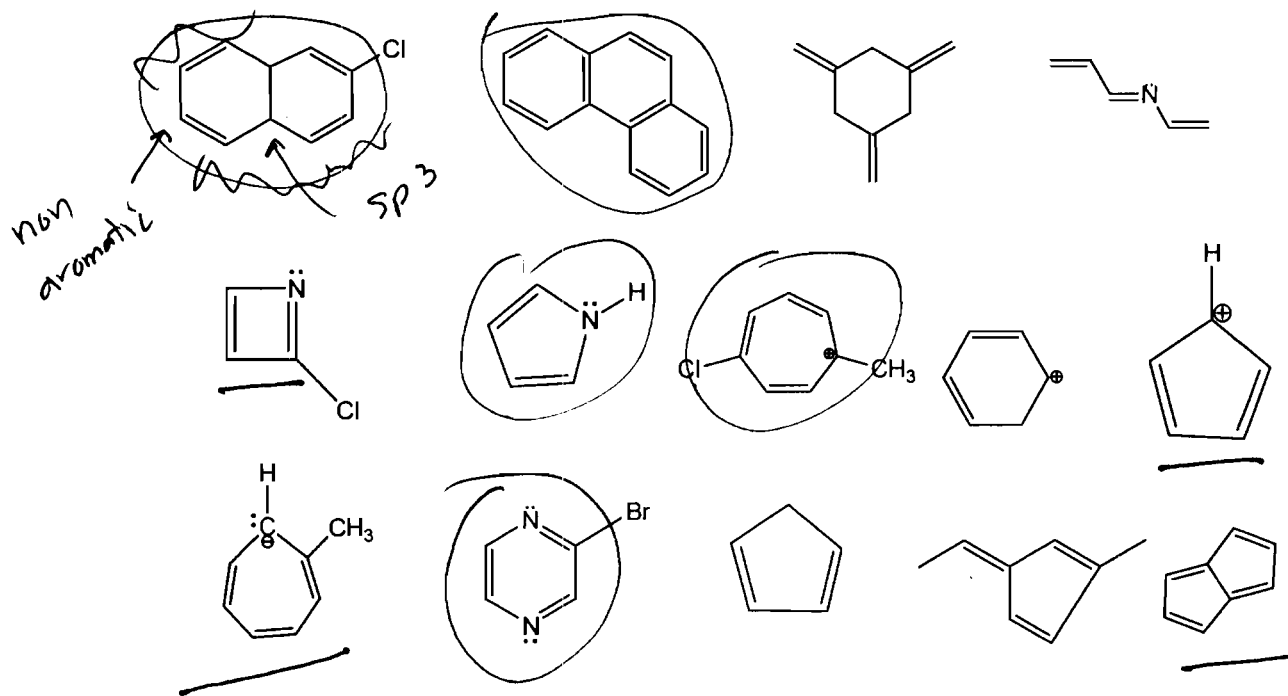
b) (5 pts) Briefly explain why reaction #2 is faster than reaction #1

#2 has stable aromatic cation

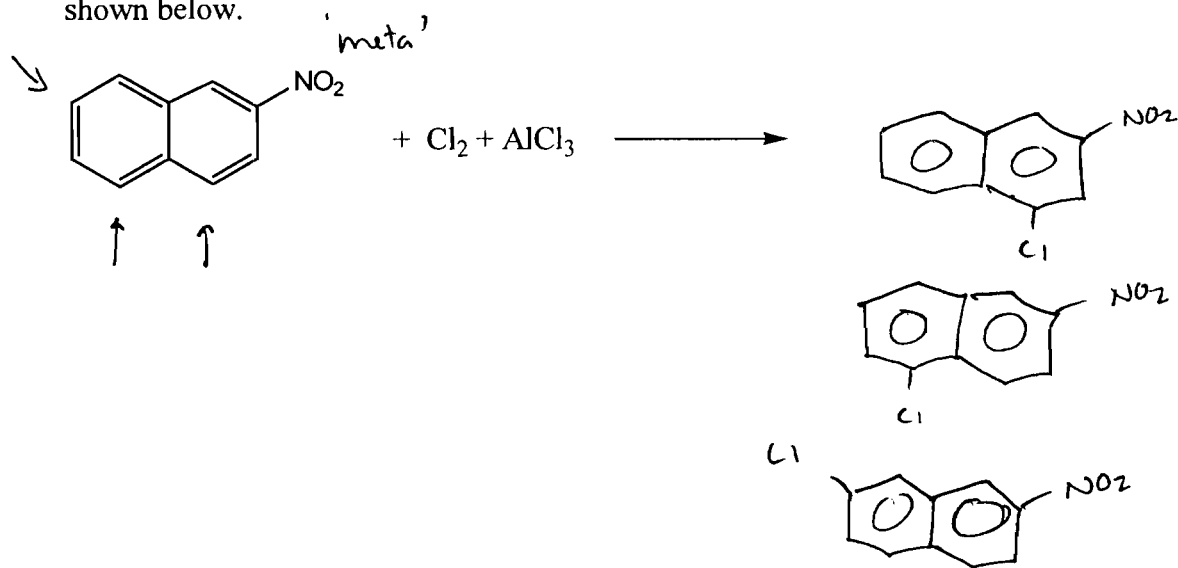


6. a)(8 pts) Circle the structures below which are **aromatic**.

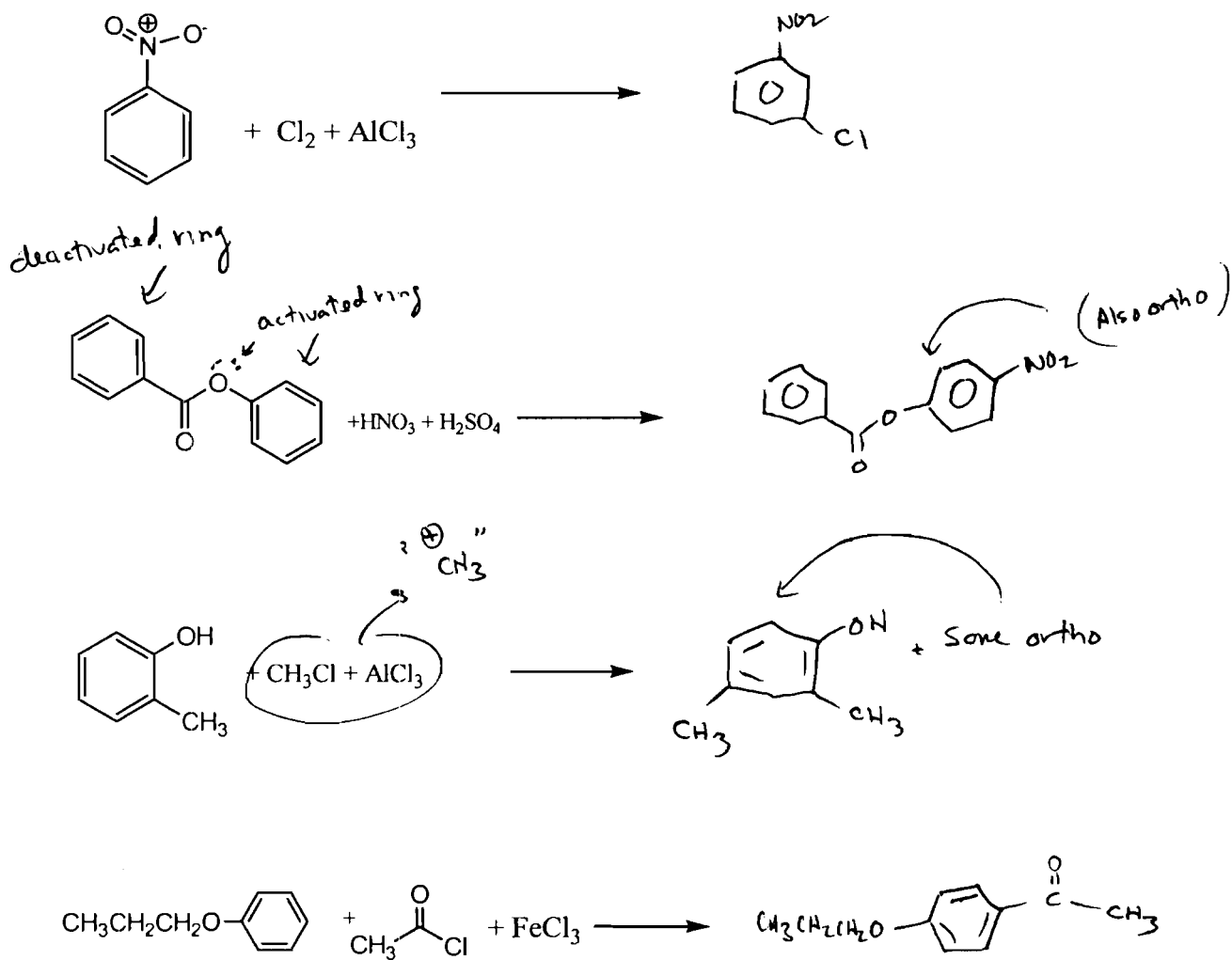
b)(8 pts) Underline the structures which are **anti-aromatic**.



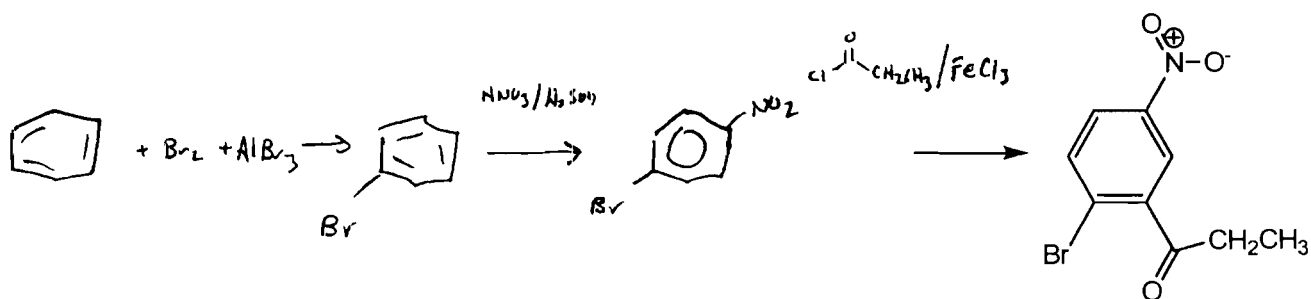
7. (6 pts) Draw all *possible* mono chlorination products for the aromatic compound shown below.



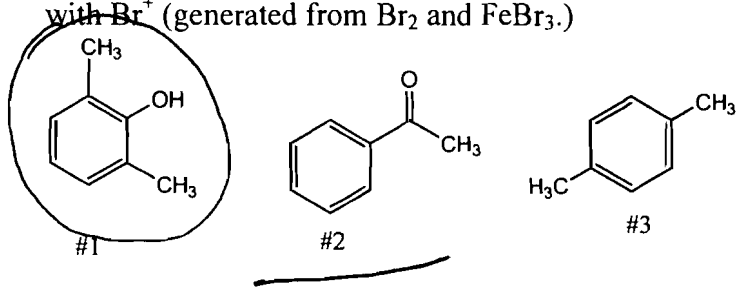
8. (5 pts each) Fill in the major organic product(s) for the reactions below



9. (8 pts) Starting from Benzene, synthesize the following compound (use electrophilic aromatic substitution reactions).



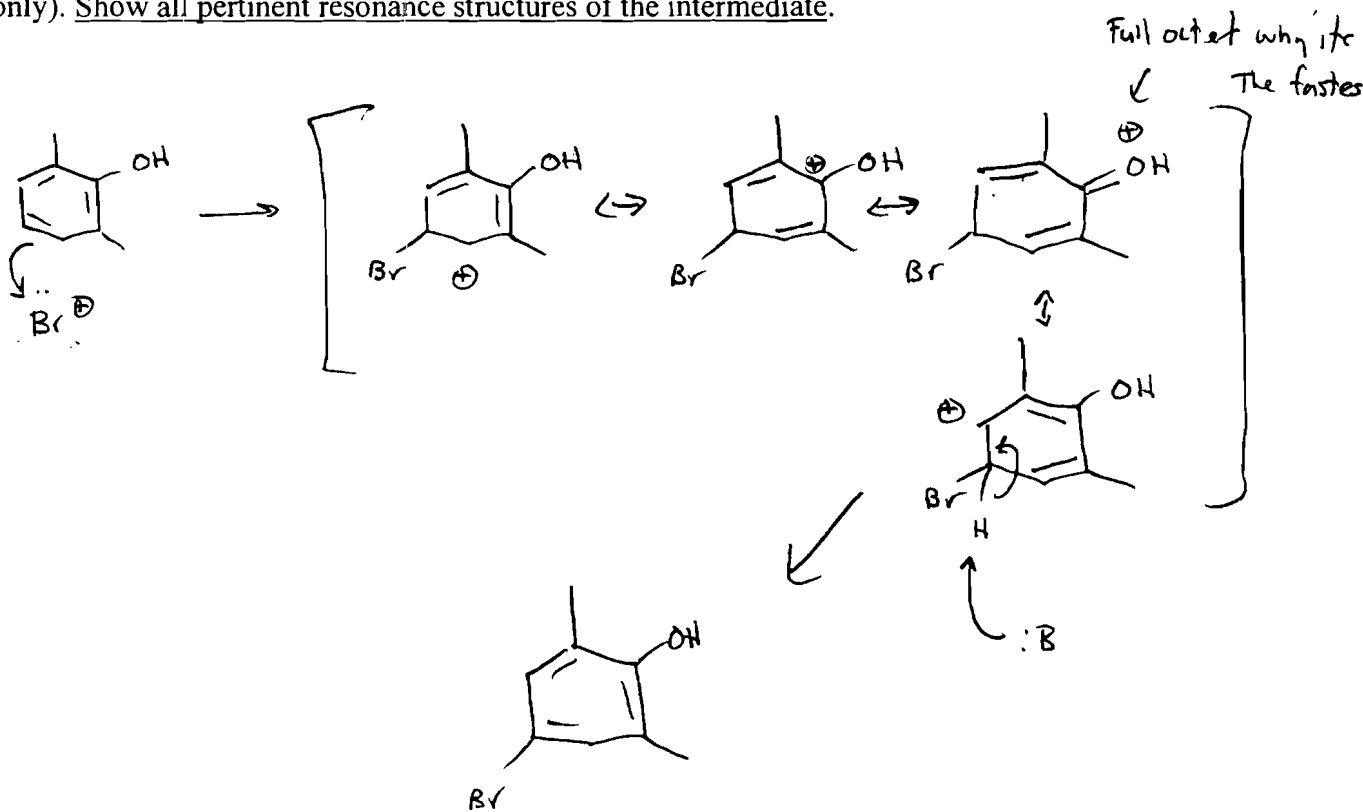
10. The 3 compounds below all undergo an Electrophilic aromatic substitution reaction with Br^+ (generated from Br_2 and FeBr_3 .)



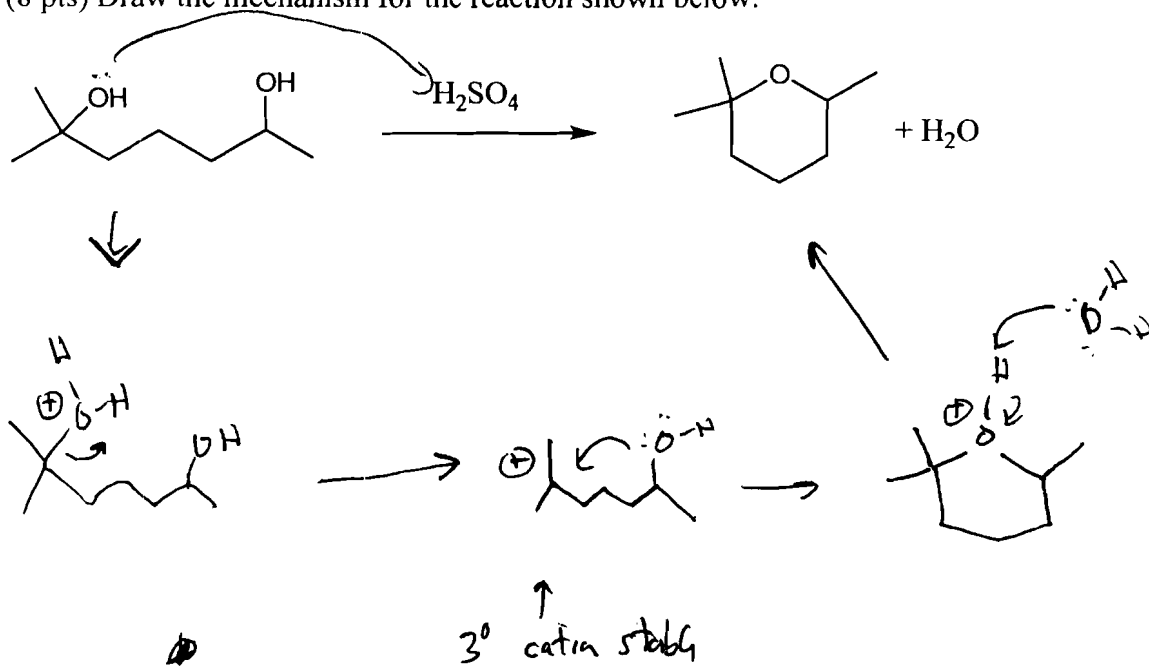
a) (3 pts) Underline the compound that would react the slowest.

b) (4 pts) **Circle** the compound that would react the fastest

c) (10 pts) Draw the **product and mechanism** for fastest reaction (the circled compound only). Show all pertinent resonance structures of the intermediate.



11. (8 pts) Draw the mechanism for the reaction shown below.



Extra credit. What would be a clever bumper sticker for Organic chemistry