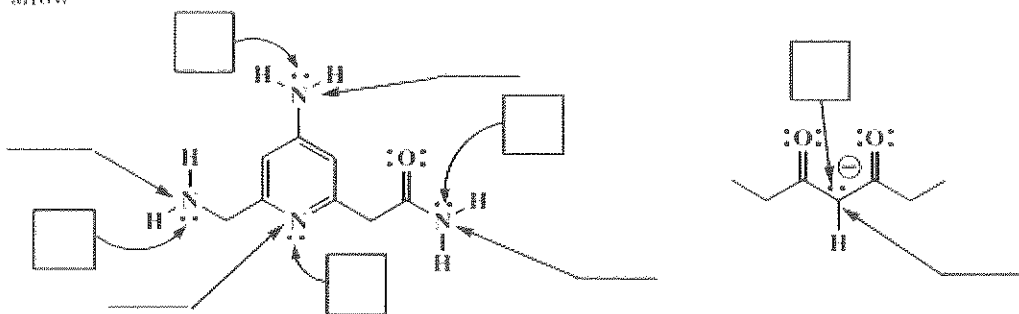
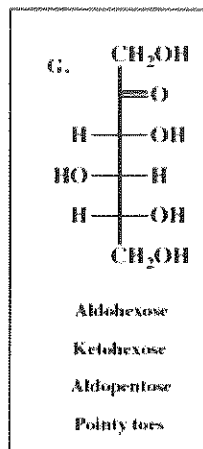
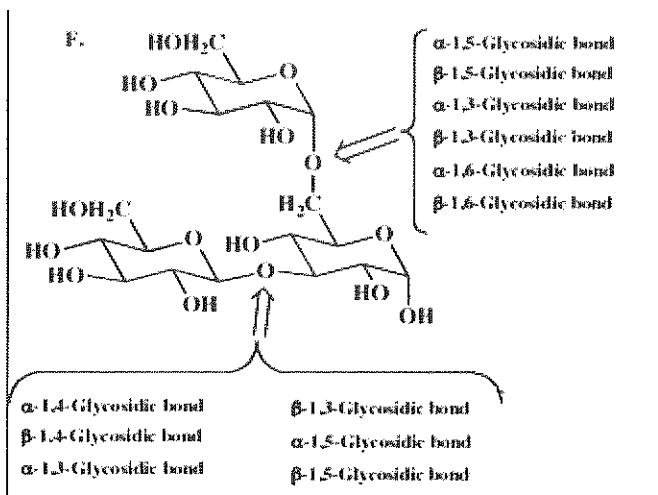
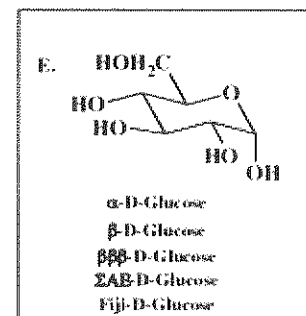
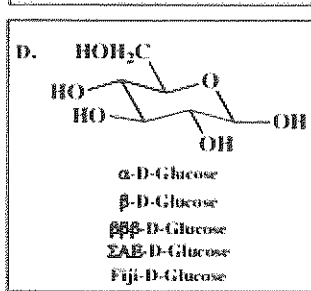
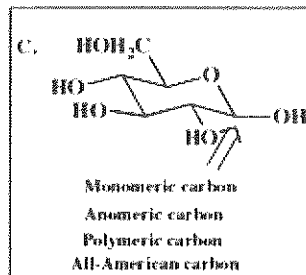
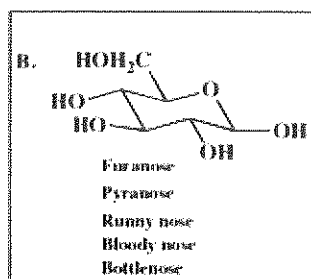
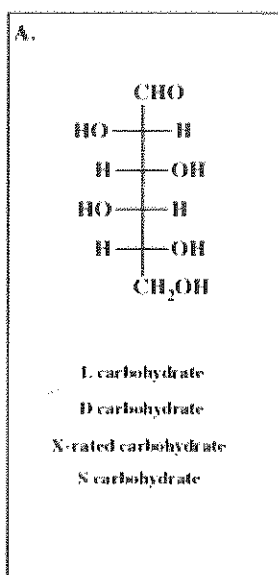


9. (2 pts each) On the lines provided, state the hybridization state of each atom indicated in the following molecule. In the box provided, state what type of atomic orbital contains the lone pair indicated by the arrow.

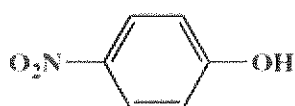
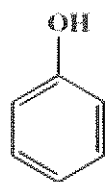
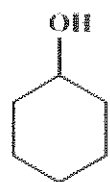


For the following structures, draw a circle around the terms that provide the most accurate description.

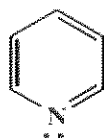


## Tuesday Problem Solving Session 5/5/15

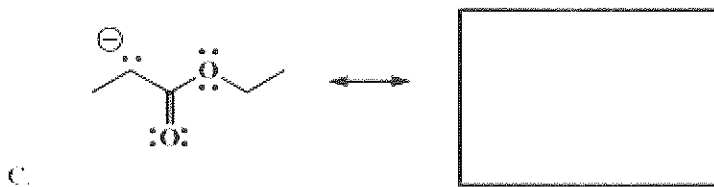
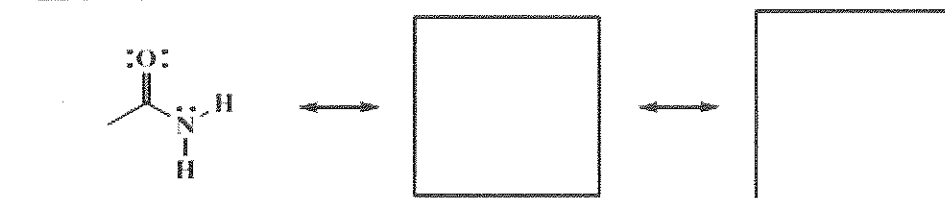
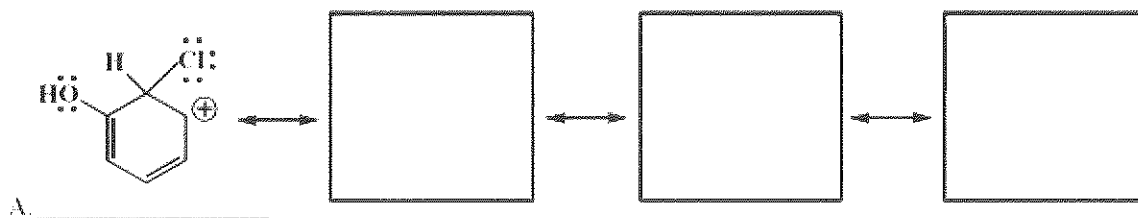
Rank from least to most acidic, with a 1 under the least acidic and a 4 under the most acidic molecule.



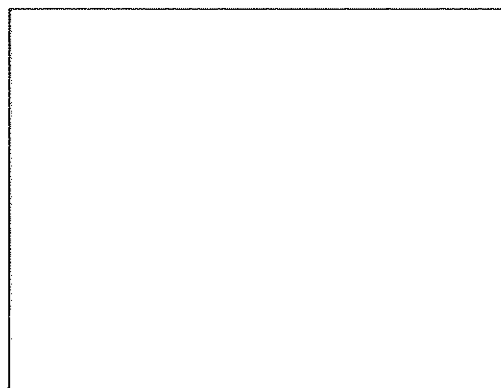
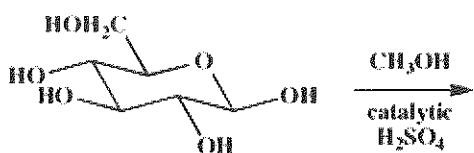
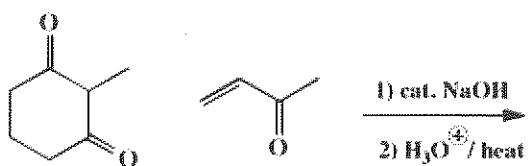
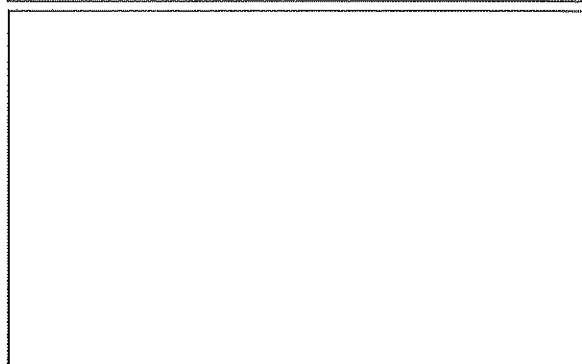
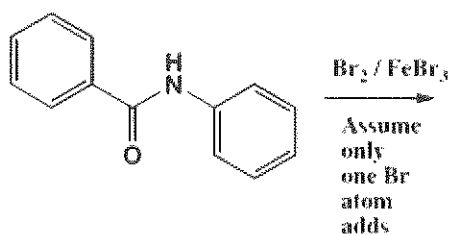
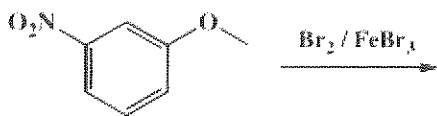
Rank from least to most basic, with a 1 under the least basic and a 3 under the most basic molecule.

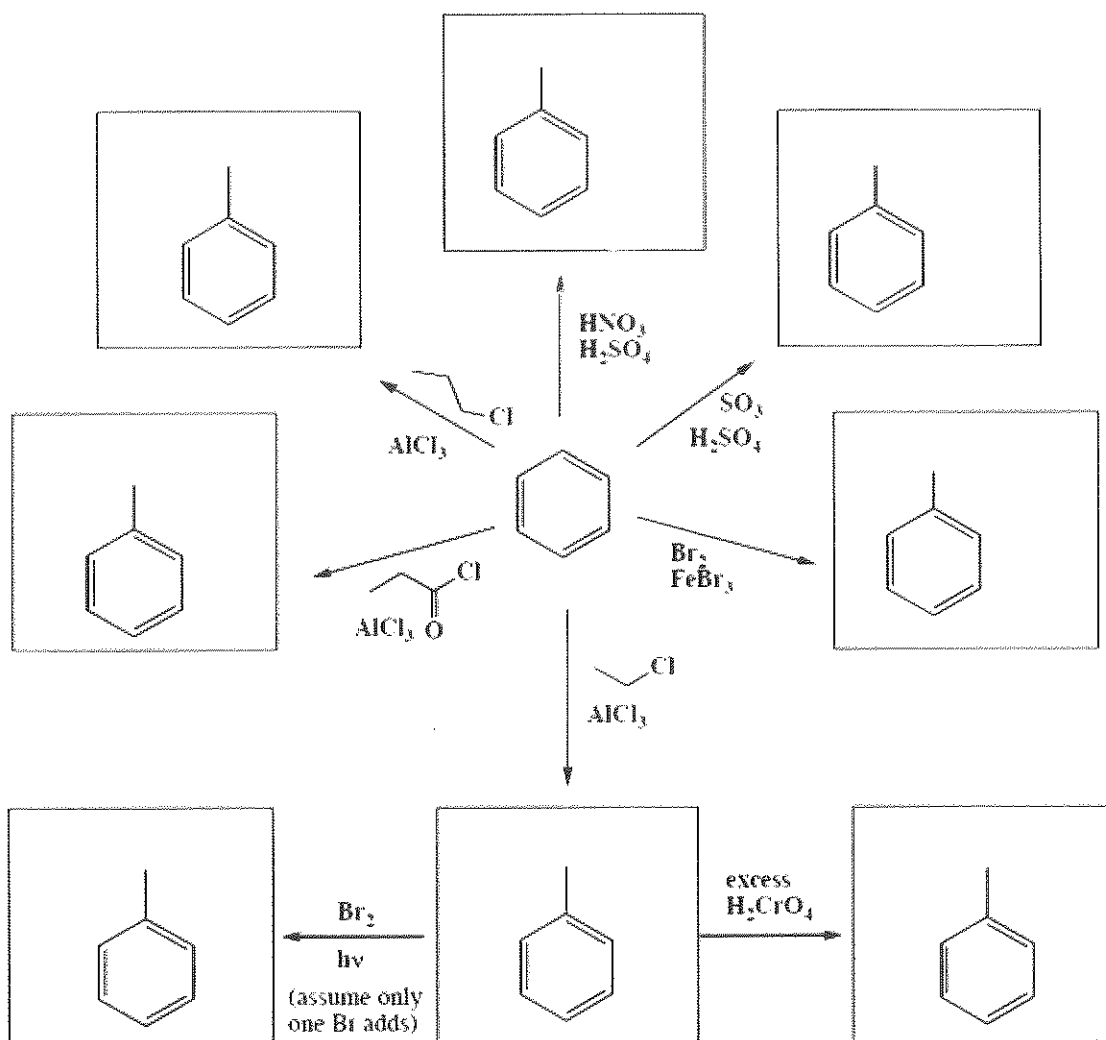


Draw the indicated number of most important resonance contributing structures. Show all lone pairs, pi bonds and formal charges. Use arrows to indicate the redistribution of electrons on each molecule to the left, that leads to the contributing structure you draw immediately to its right. Only the structure on the farthest right will have no arrows. For each set, A, B, and C indicate the type of molecule/ion.

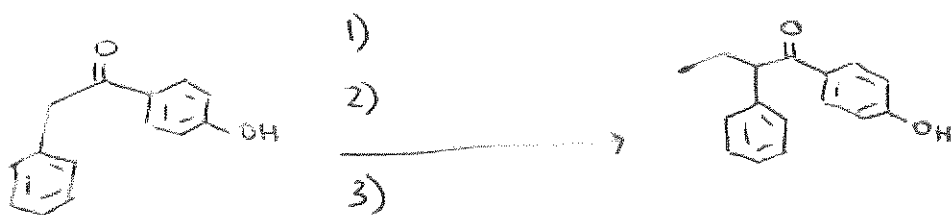


Predict the product(s):



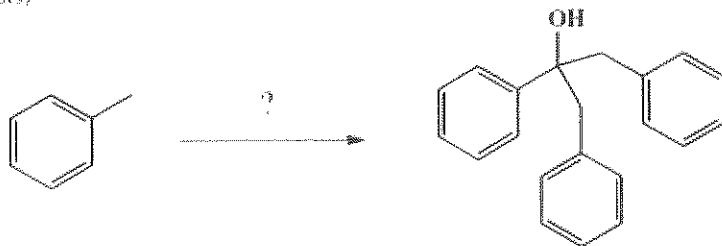


Predict the Reagents:

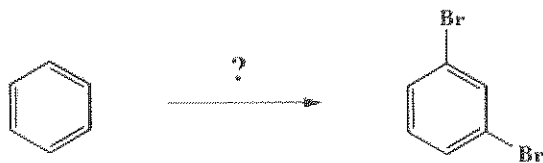


18. Using any reagents turn the starting material into the indicated product. All the carbons in the product must come from the given starting material or starting materials. Draw all molecules synthesized along the way. When in doubt, draw the molecule! If an ortho/para mixture will be the major products of a reaction, you can choose whether you would like to isolate the ortho or para product for your synthesis.

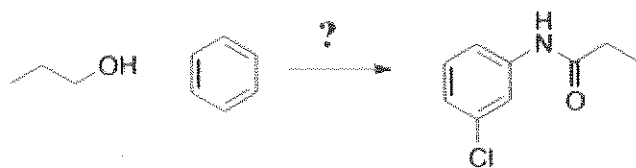
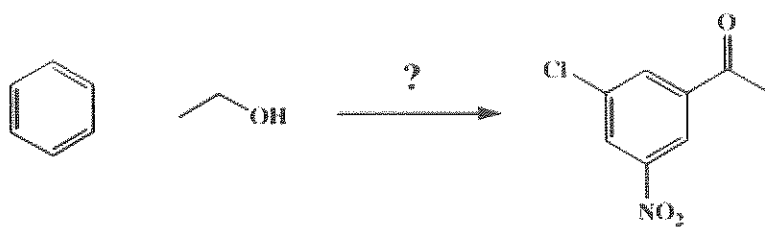
C) (16 pts)



(13 pts)



(13 pts)



22. Using any reagents turn the starting material into the indicated product. All carbon atoms in the product must come from the starting material. Draw all molecules synthesized along the way. When in doubt, draw the molecule! Label all chiral centers with an asterisk (\*) and make sure to right "Racemic" where appropriate.

Remember, all of the carbons of the product must come from the given starting material.

(13 pts)

D)

