

Exam 2

Name: _____

Chemistry 3332

Signature: _____

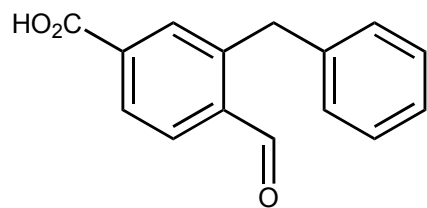
ID# _____

PLEASE CIRCLE CLASS TIME!

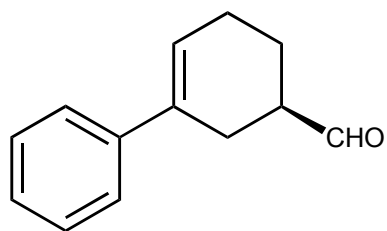
10:00 AM

1:00 PM

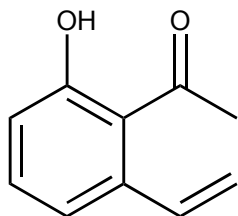
1.



2.

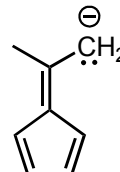
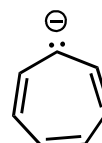
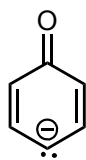
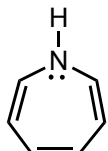
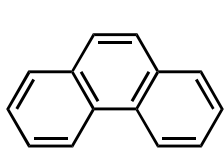


3.

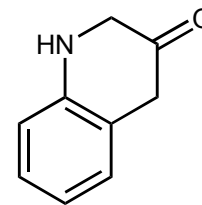
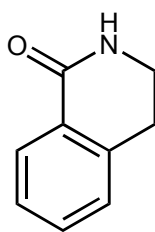
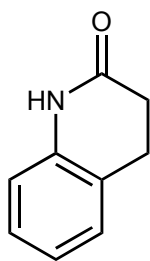


B. Facts: 19 points

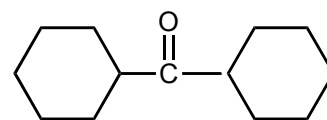
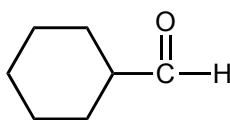
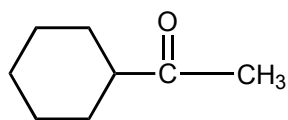
1. Label the molecules below as aromatic (**AR**), antiaromatic (**AA**), or nonaromatic (**NA**). Please assume all are planar



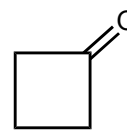
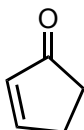
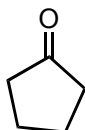
2. Rank the following substituted benzene compounds in order of increasing reactivity by electrophilic aromatic substitution. (1=least reactive, 3=most reactive) (3 pts).



3. Rank the following compounds in order of increasing reactivity with a nucleophile. (1=least reactive, 3=most reactive) (3pts)

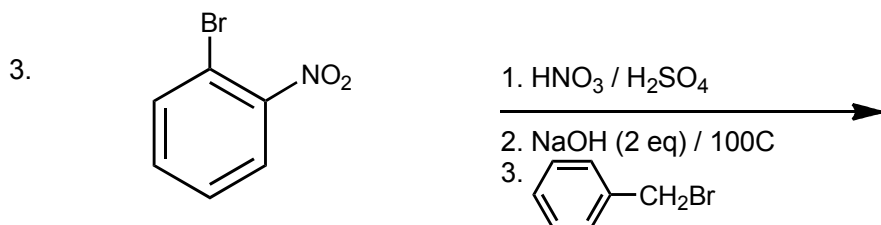
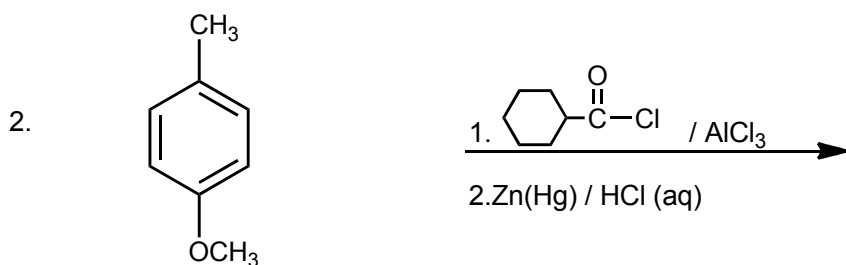
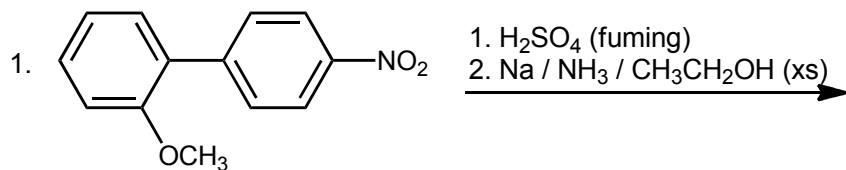


4. Place the following compounds in order of increasing frequency of the C=O stretch. (1=lowest frequency, 3=highest frequency) (3 pts)

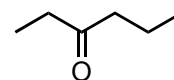
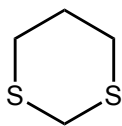


C. Reactions: Total = 36 points, 4 points each

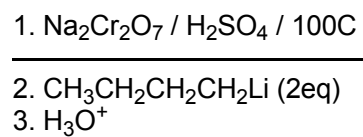
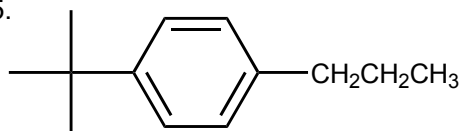
Please provide the major product or the reagents in the answer box. Be sure your drawing indicates **stereochemistry** if applicable. Partial credit is awarded only when intermediate products in a multi-step reaction are shown below the reaction.



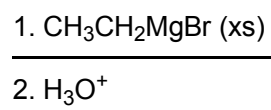
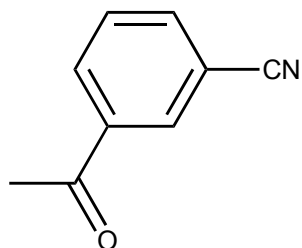
4.



5.

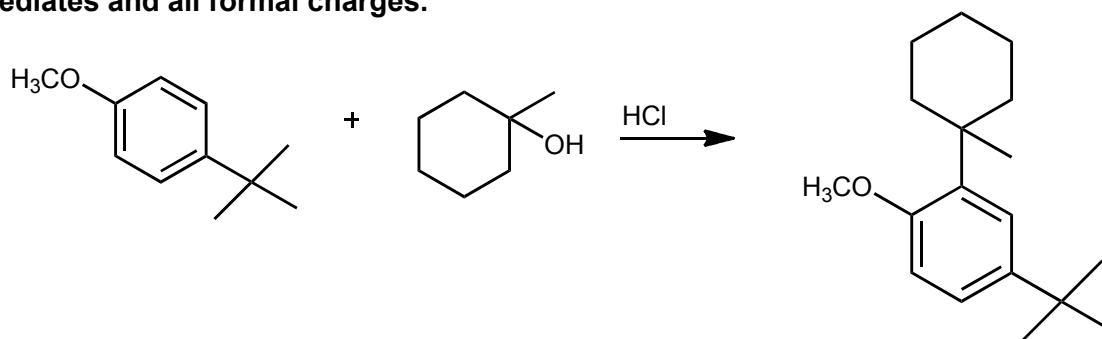


6.



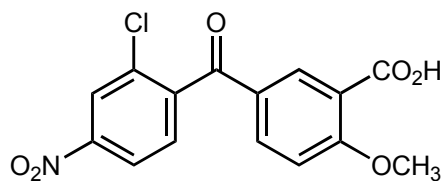
D. Mechanism (11 points)

Provide a clear mechanism to explain the formation of the product shown in the reaction below. Use curved arrows to indicate "electron flow". Remember to show only one step at a time. **Show all intermediates and all formal charges.**

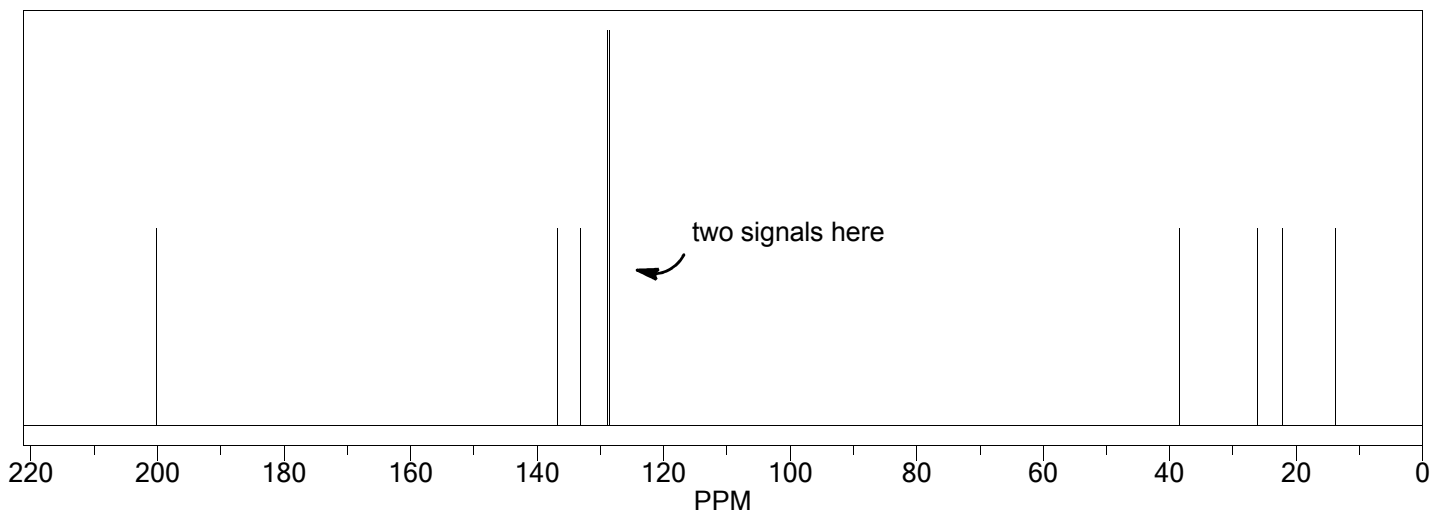
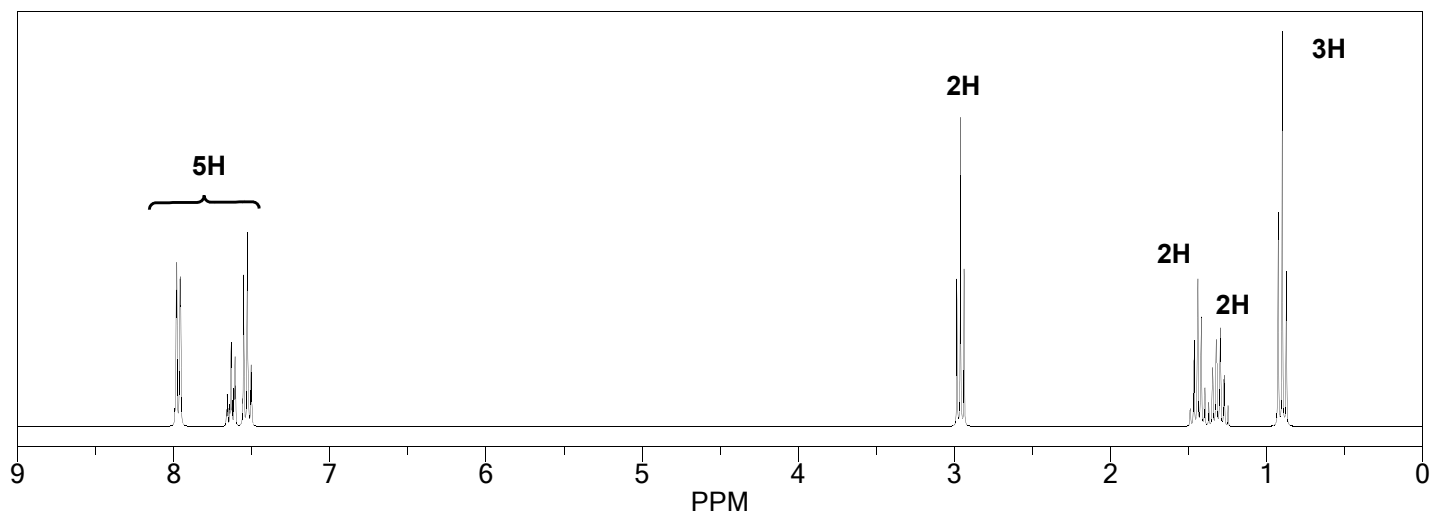
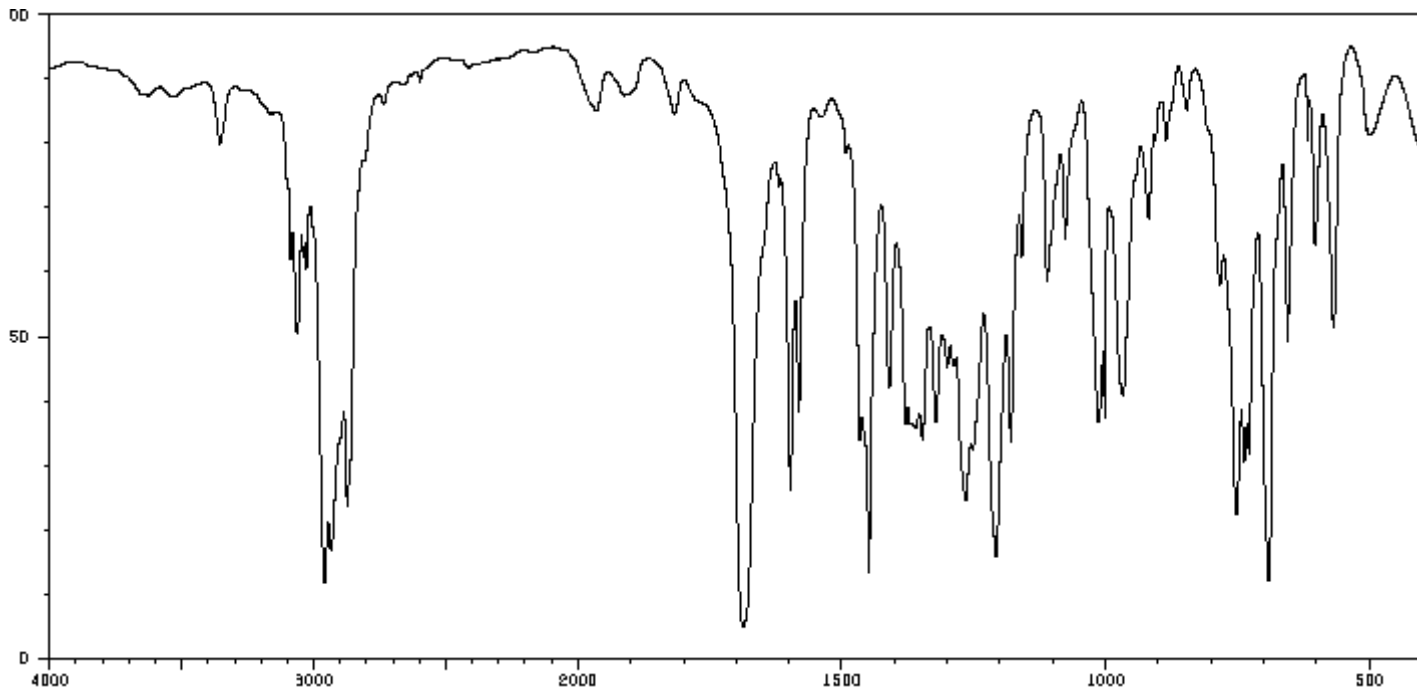


E. Synthesis (10 points)

Synthesize the molecule below using any of the following reagents: alcohols, alkanes, alkenes, and or alkynes of **one carbon**, cyclohexane, benzene, any inorganic reagents, any oxidizing or reducing agents, and any peroxyacids.



A compound with the formula $C_{11}H_{14}O$ exhibits the IR and 1H MNR shown below. Please identify this compound and draw the structure in the box provided below. (6 pts)





$C_{11}H_{14}O$