

Second Exam

Chemistry 3332

March 27, 2015

Name: _____

Signature: _____

ID# _____

PLEASE CIRCLE CLASS TIME!

10:00 AM

1:00 PM

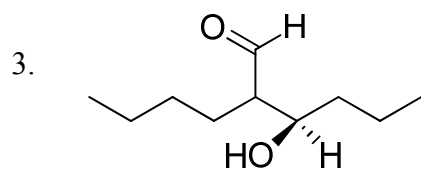
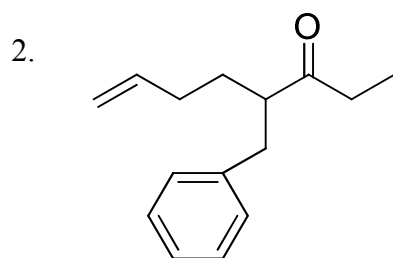
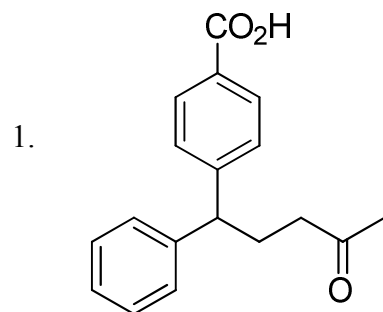
Page #	Score	
1. 12 pt		
2. 18 pt		
3. 18 pt		
4. 18 pt		
5. 12 pt		
6. 12 pt		
7. 10 pt		

Total: _____

NOTE: Present your ID when you return the exam booklet.

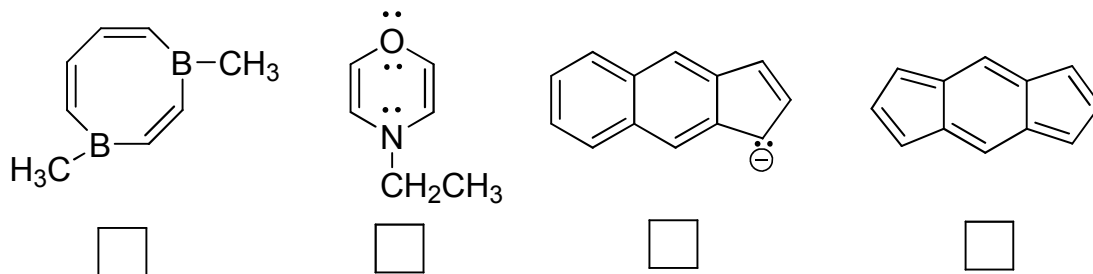
A. Nomenclature: (12 points)

Given an acceptable IUPAC name for each of the compounds. Be sure to indicate the **stereochemistry** where appropriate.

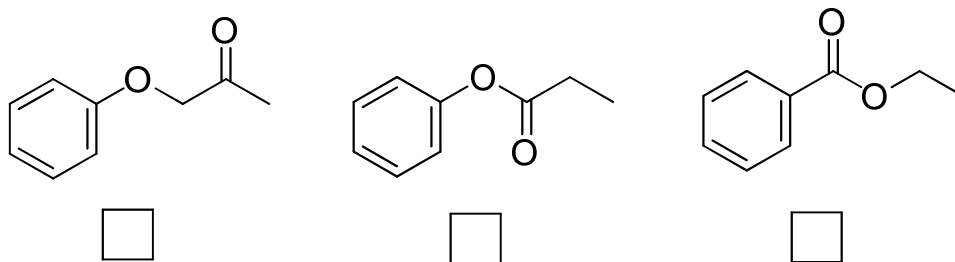


B. Facts: 18 points

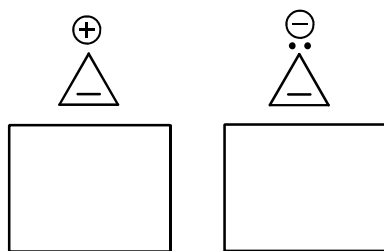
1. Label the molecules below as aromatic(**AR**), antiaromatic(**AA**), or nonaromatic(**NA**). Please assume all are planar. (8 pts.)



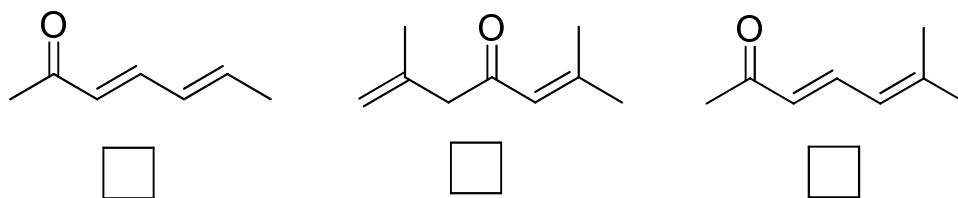
2. Rank the following substituted benzene compounds in order of increase rate in a reaction with Br_2 and FeBr_3 . (1=slowest rate, 3=fastest rate) (3 pts.)



3. In the box below each ion, draw its energy level diagram using the polygon rule. Without using the Huckel Rule equation, briefly explain why the cation is aromatic while the anion is antiaromatic. (4pts)



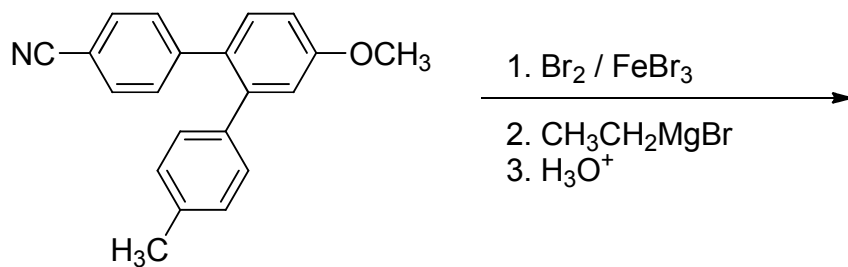
4. Rank the following compounds in order of increasing λ_{max} (wavelength) of the π to π^* transition in the UV spectrum. (1=shortest wavelength, 3=longest wavelength) (3 pts.)



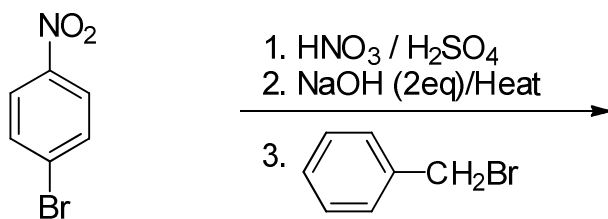
C. Reactions: Total = 36 points, 6 points each

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

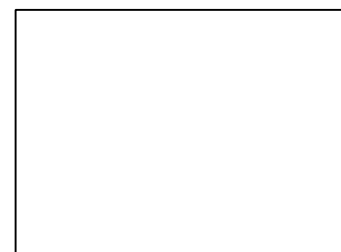
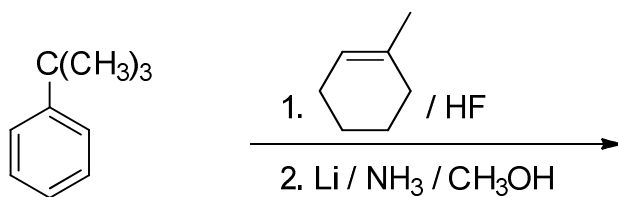
1.

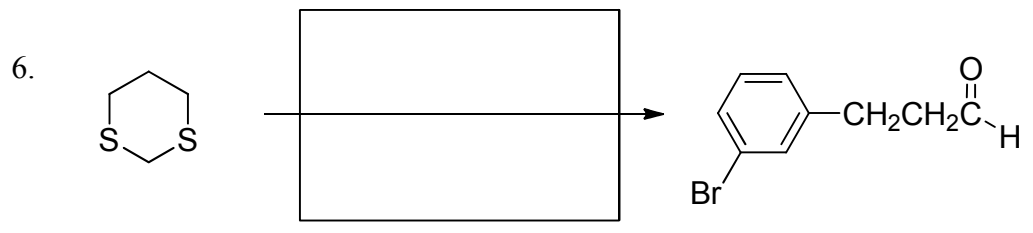
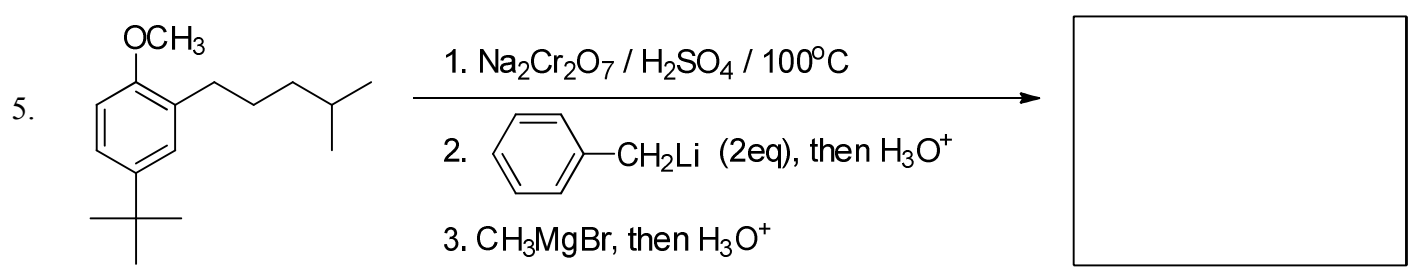
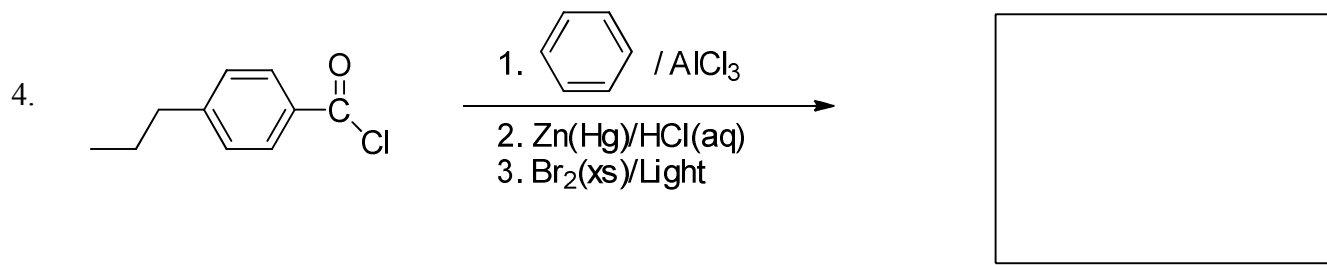


2.



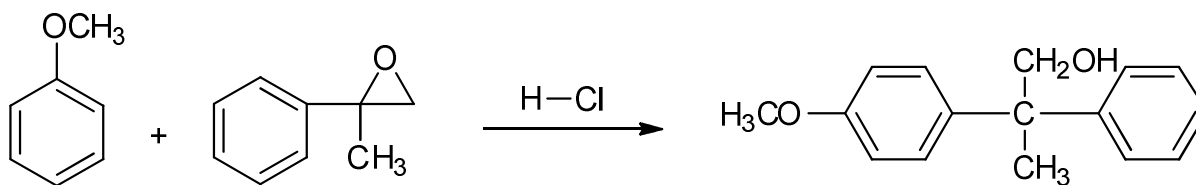
3.





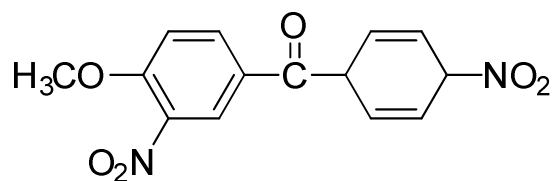
D. Mechanism: (12 points)

Provide a clear mechanism to explain the formation of the product. Use curved arrows to indicate “electron flow”. **Show all intermediates and all formal charges. When more than one resonance contributor may be drawn, be sure to draw the most stable contributor.**



E. Synthesis: 12 Points

Synthesize the molecule below using **benzene**, **methanol**, any inorganic reagents, and any oxidizing or reducing agents.



F. Spectroscopy: 10 Points

A compound with the formula $C_{10}H_{12}O$ exhibits the IR, 1H NMR and proton decoupled ^{13}C NMR spectra shown below. Please identify this compound and draw the structure in the box provided below.

