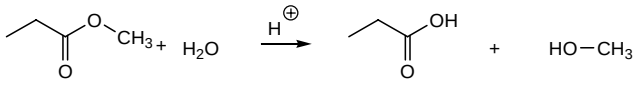
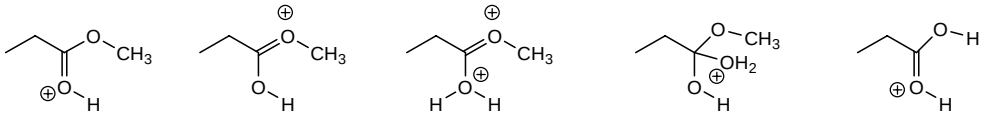
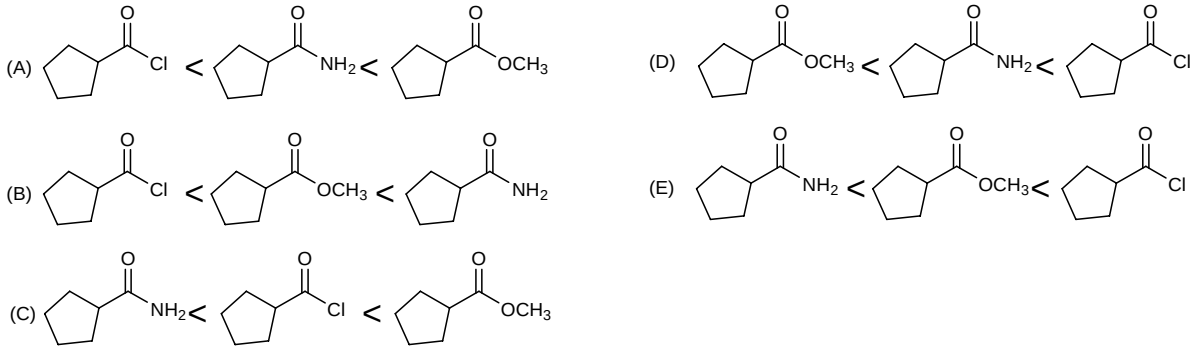
Multiple Choice Questions. 60 points

1. Choose the species least likely to be an intermediate in the acid catalyzed hydrolysis of methyl propionate to the carboxylic acid. C

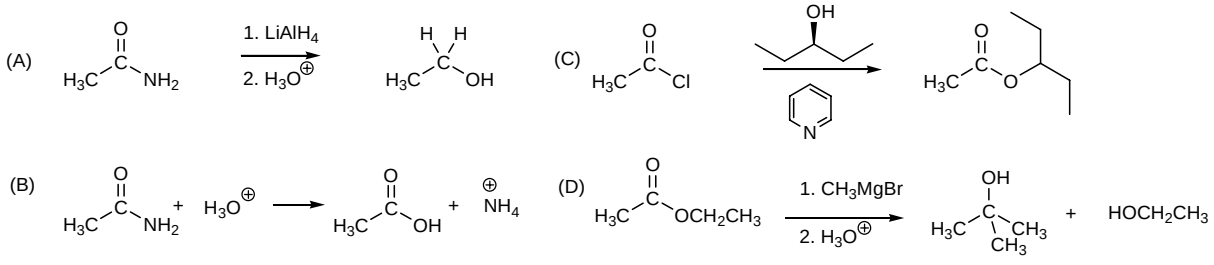




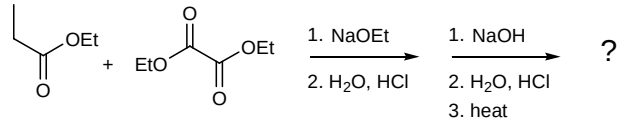
2. Choose the order that has the following compounds correctly arranged with respect to increasing reactivity toward hydroxide ion. (most reactive on the right) E

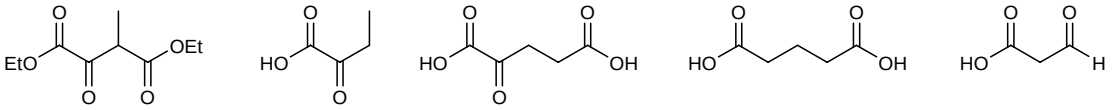


3. Choose the reaction that *will not* proceed as shown. A



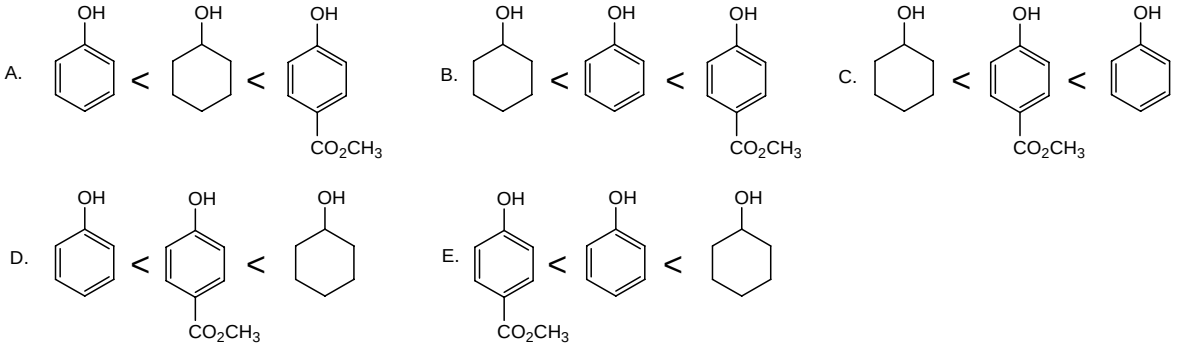
4. Choose the major product of the following reaction sequence. B



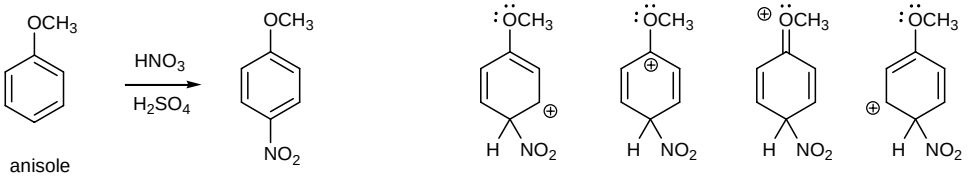


(A) (B) (C) (D) (E)

5. Choose the order that has the following alcohols correctly arranged with respect to increasing acidity. B

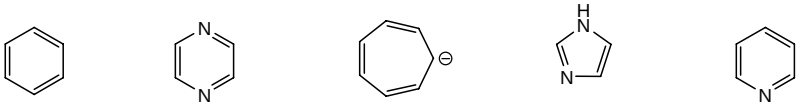


6. Choose the resonance structure that best represents the intermediate in the nitration of anisole. C



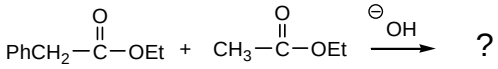
(A) (B) (C) (D)

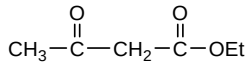
7. Select the compound that would *not* be aromatic. C

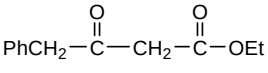


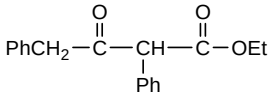
A. B. C. D. E.

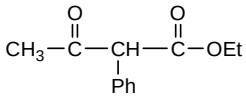
8. Choose the species that would be predicted *not* to be produced in the following Claisen reaction. D

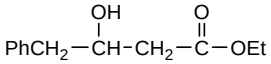


A. 

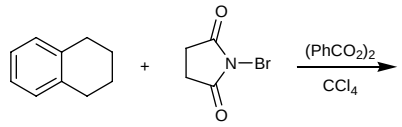
C. 

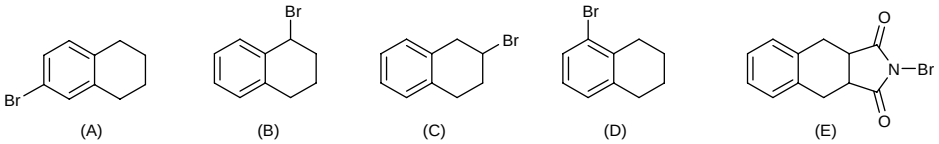
E. 

B. 

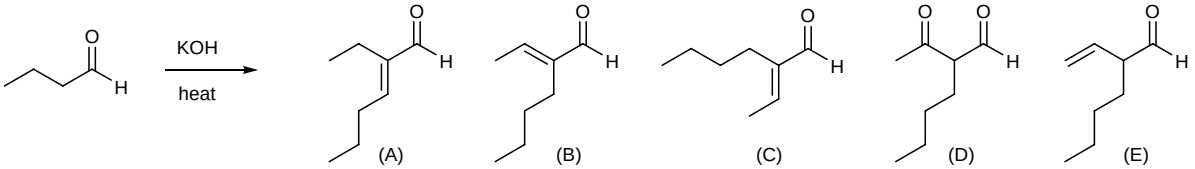
D. 

9. Choose the major product of the following reaction. B

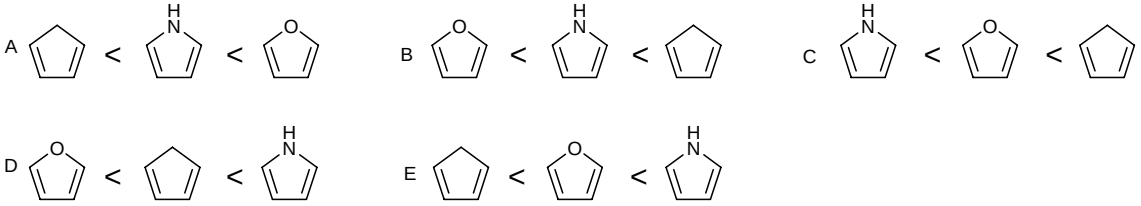




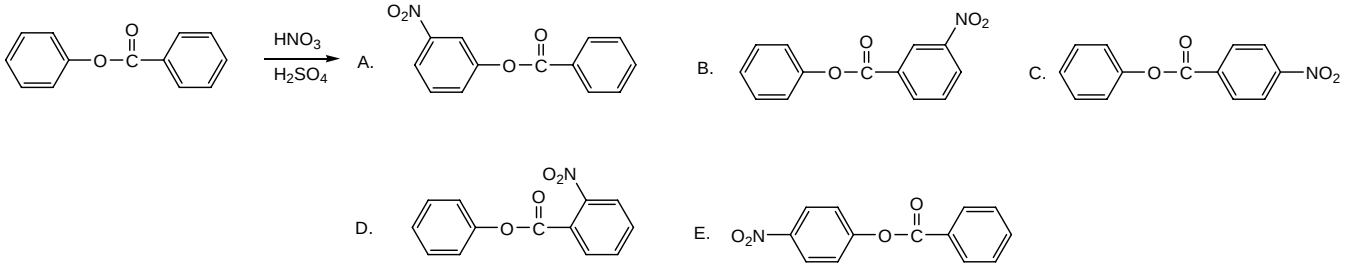
10. Choose the major product of the following reaction. A



11. Choose the order that has the following compounds correctly arranged with respect to increasing stability due to electron delocalization (most stable on the right) E

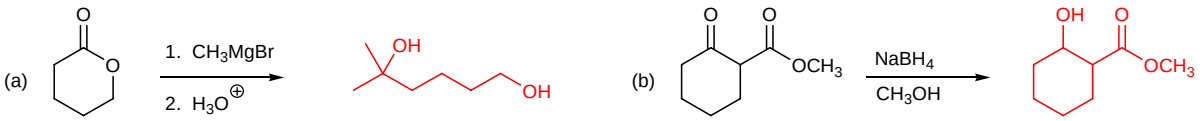


12. Predict the major product of the following reaction sequence. E

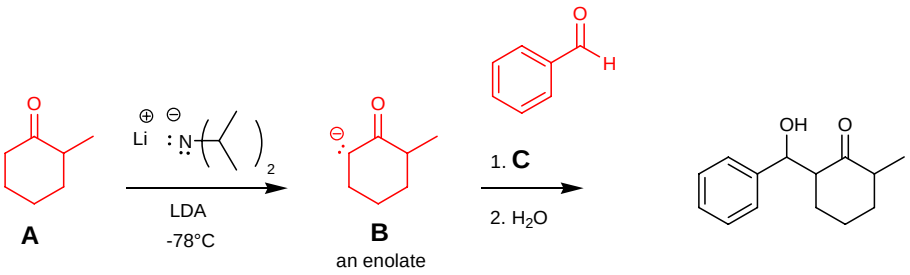


Short Answer Questions. 40 points.

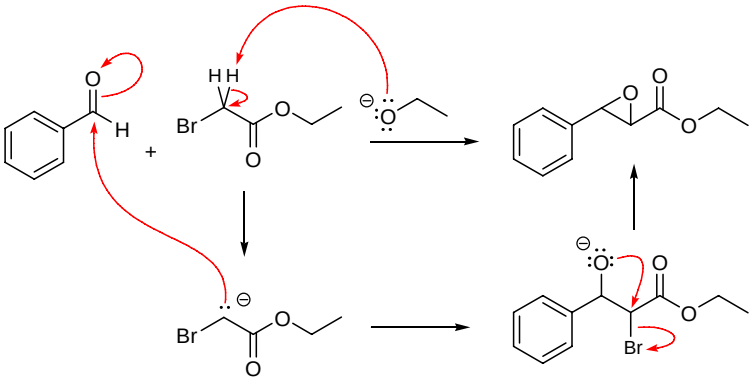
13. Predict the products of the following reactions.



14. Give the structures of **A**, **B** and **C** that would complete the reaction sequence to produce the compound shown on the right.



15. Using the curved arrow formalism show the bond making and bond breaking steps involved in the following reaction.



16. Propose a synthesis of the following compound from benzene and compounds containing four carbon atoms or less.