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STUDENTS WHOSE NAMES WE CAN'T READ!**

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FIRST NAME _____ *PRINTED*
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Points by question

1 _____ / 13

2 _____ / 22

3 _____ / 42

4 _____ / 40

5 _____ / 36

6 _____ / 22

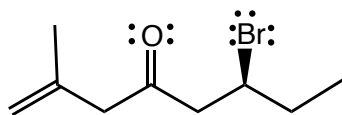
Points Removed for cover errors _____ / 2

Extra Credit _____ / 5

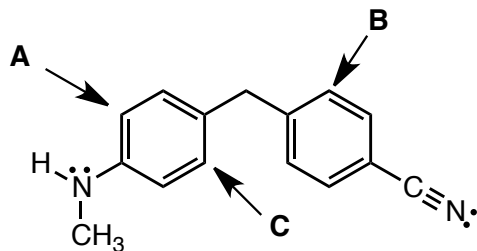
Total (incl Extra) _____ / 175 + 5

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Question 1 (13 pts). Give the IUPAC name for the following compound. Be sure to use cis/trans, E/Z or R/S where appropriate.



Question 2 (22 pts). Rank in order of increasing rate of electrophilic aromatic substitution at the carbons indicated by the arrows. Give a BRIEF explanation.



slowest < — < fastest

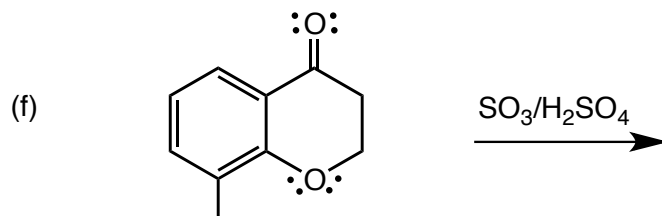
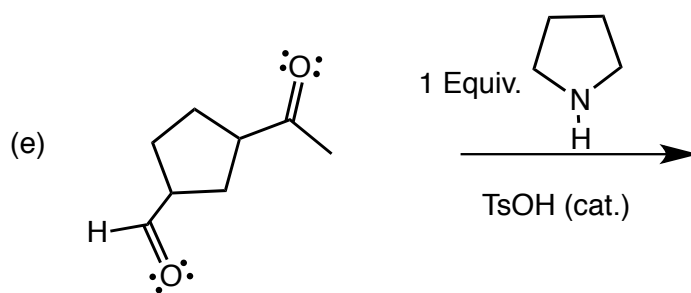
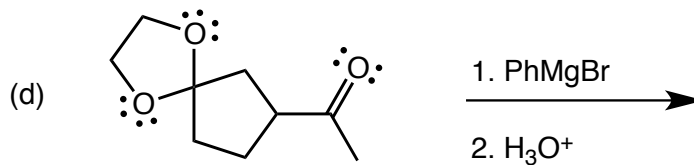
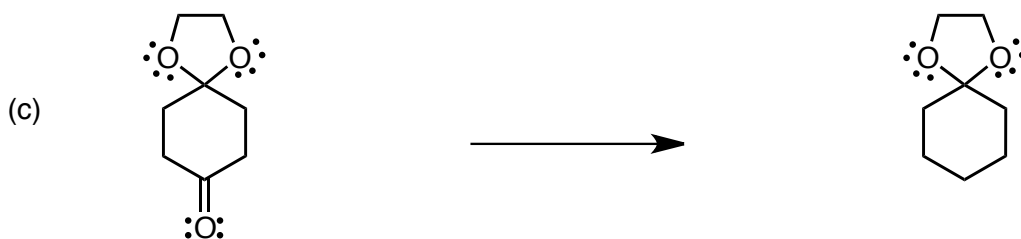
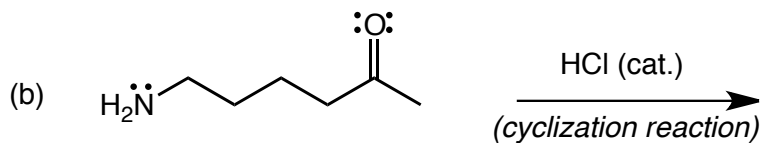
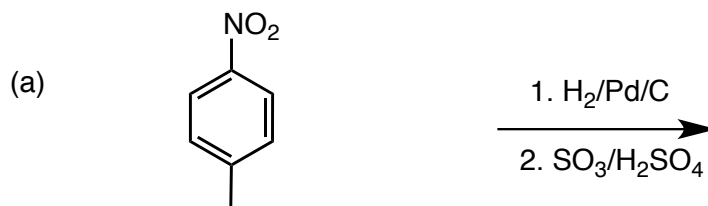
Extra Credit (5 pts). Health problems associated with the use of Agent Orange defoliant in the Vietnam war are thought to be associated with the presence of an impurity produced when Agent Orange was synthesized. This impurity had what kind of chemical structure?

Chlorinated Aldehyde

Chlorinated Ketone

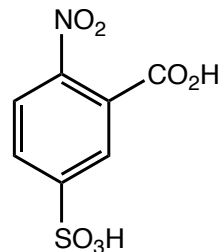
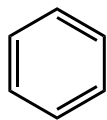
Chlorinated Aromatic

Question 3 (42 pts.) Provide the missing major organic products or reagents/conditions as appropriate, you can IGNORE stereochemistry in these problems

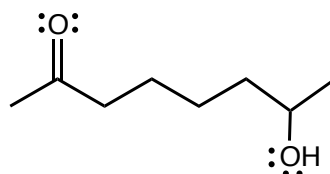
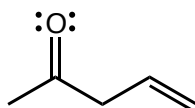


Question 4 (40 pts.) Synthesize the (target) molecules on the right from the starting molecules the left. this can not be done in one reaction. Give reagents and conditions and the intermediate molecules at each step. Do not show any mechanisms or transient intermediates. If other isomers are formed at any step then you need to indicate this but you do not need to draw their structures.

a)



b)



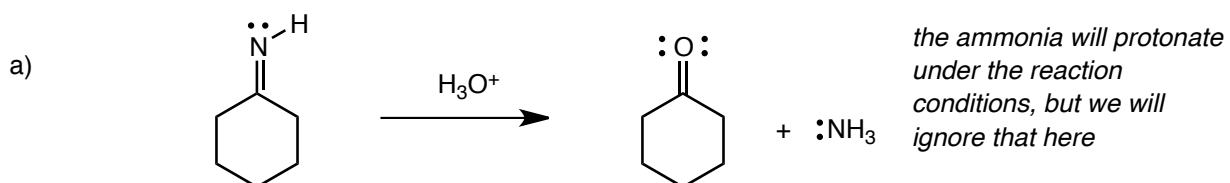
Question 5 (36 pts.) For the following TWO reactions a) and b):

1) Give complete curved arrow-pushing mechanisms

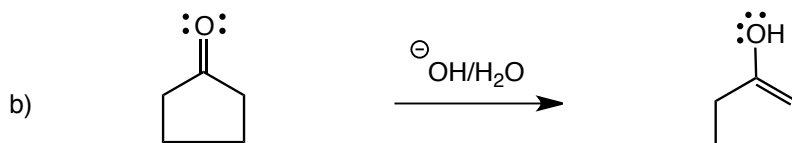
2) Indicate the lewis acid/base for each INTERmolecular step (LB or LA) and whether they are also Brønsted bases/acids (LB/BB or LA/BA)

3) Show where every proton comes from and goes to (i.e., no $+H^+$ or $-H^+$)

4) DRAW ALL RELEVANT RESONANCE CONTRIBUTORS FOR THE INTERMEDIATES



Give the number of steps in your mechanism for reaction a) _____



Give the number of steps in your mechanism for reaction b) _____

Question 6 (22 pts.) For the following TWO reactions a) and b):

1) Give complete curved arrow-pushing mechanisms

2) Indicate the lewis acid/base for each INTERmolecular step (LB or LA) and whether they are also Brønsted bases/acids (LB/BB or LA/BA)

3) Show where every proton comes from and goes to (i.e., no $+H^+$ or $-H^+$)

4) DRAW ALL RELEVANT RESONANCE CONTRIBUTORS FOR THE INTERMEDIATES

