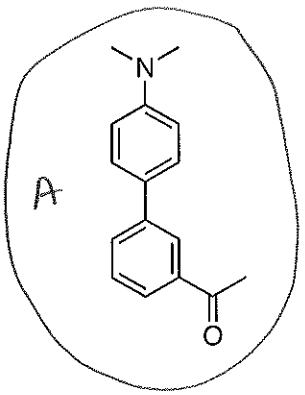
Chem 332
Exam 1
March 10, 2009
Prof. Fox
50 minutes
80 points

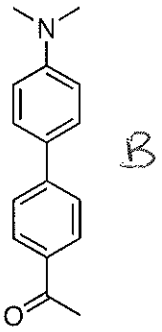
Show your work in detail

WRITE YOUR NAME ON EVERY PAGE

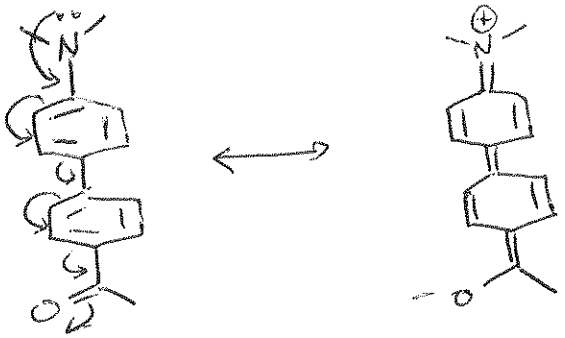
NAME _____

1 Circle the product below that is the stronger amine base. Provide a detailed but brief explanation to support your answer. Use chemical structures to support your answer. (15 points)



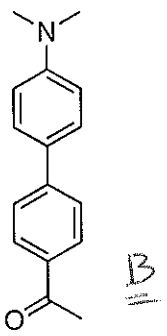




THE BASICITY OF AMINE **B** IS DECREASED BECAUSE IT IS CONJUGATED WITH THE CARBONYL.

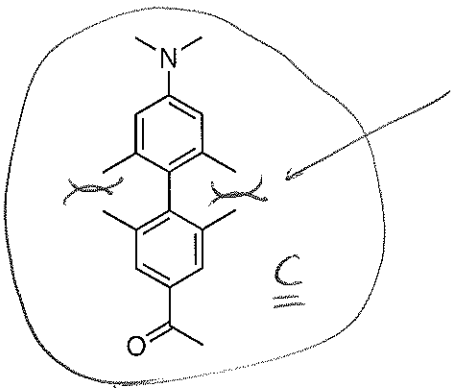



FOR AMINE **A**, there ARE NO VALID RESONANCE STRUCTURES in which THE AMINE IS DELOCALIZED WITH THE CARBONYL. THUS, **A** IS MORE BASIC.

2 Circle the product below that is the stronger amine base. Provide a detailed but brief explanation to support your answer. Use chemical structures to support your answer. (15 points)



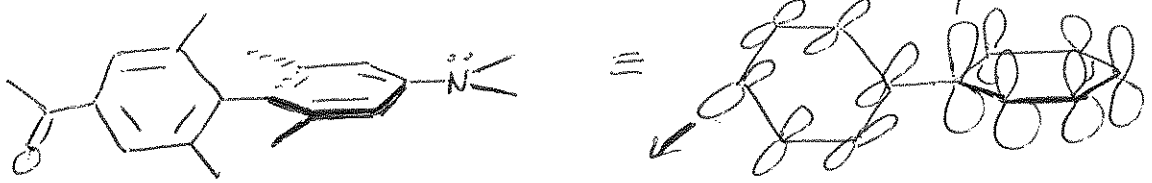

B



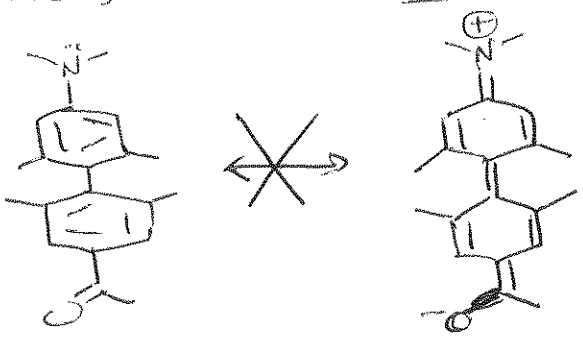

C

THE BASICITY OF AMINE B IS LOWERED BY CONJUGATION TO THE CARBONYL, AS DESCRIBED ON THE PRIOR PAGE.

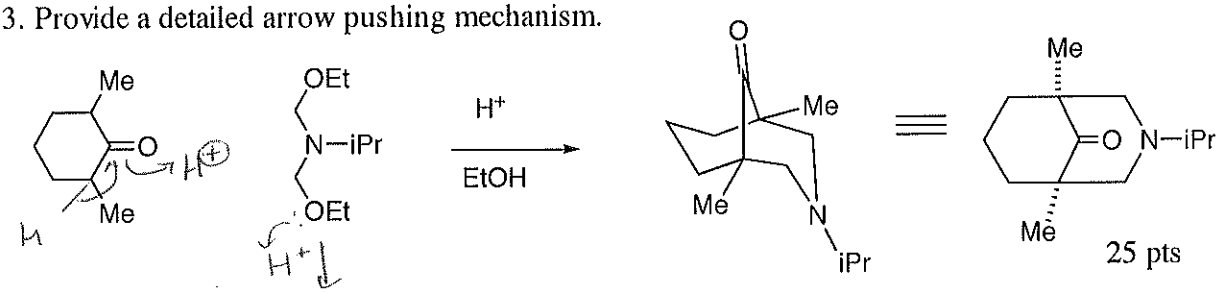
FOR C, THE STERIC INTERACTIONS OF THE FOUR METHYL GROUPS ON THE BIPHENYL CAUSE THE SYSTEM TO BE NON-PLANAR.



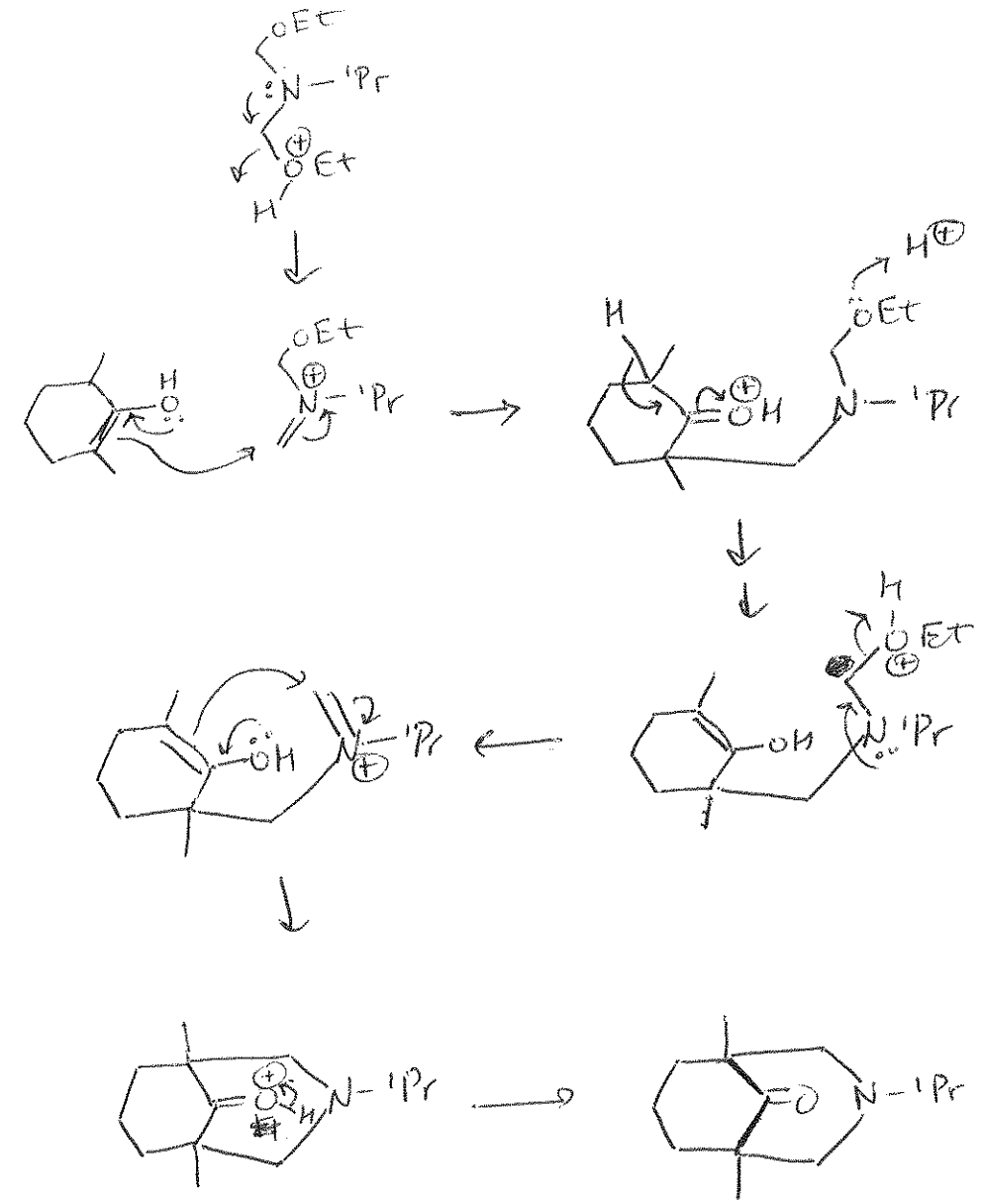
BECAUSE THE $\pi$-SYSTEMS OF THE BENZENES ARE ORTHOGONAL, THERE IS NOT EFFECTIVE CONJUGATION:



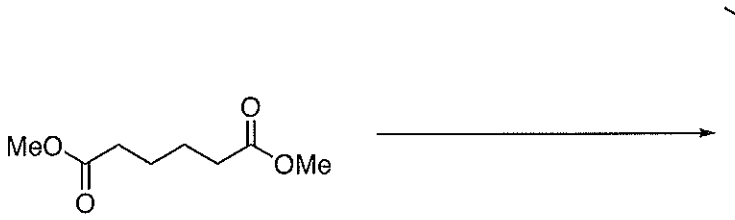
3. Provide a detailed arrow pushing mechanism.




25 pts



4 Provide a synthesis of **2** from **1** and any materials that contain **3 carbons or less.** Reagents that do not become incorporated into the product (e.g. nBuLi, PPh3) may be employed




25 pts

**1** **2**

NaOMe then $H^+$

NaOMe

Br

$CO_2Me$

NaOH ; then $H^+$, $\Delta$

$NaBH_3CN$ $H^+$

$NaBH_3CN$ $H^+$

$NH_2$ + $H_2C{=}O$