Spring 2007 Org II Q3 Ch 18-19 (20 questions for 20 points)

NAME: _____

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(1-10) Are True or False

1) Amines can act as bases because of the nitrogen atom which has a lone pair of electrons.

2) Aqueous solutions of amines have pH values greater than 7.

3) Aldehydes and ketones can undergo nucleophilic addition reactions.

4) Aldehydes and ketones can undergo condensation reactions.

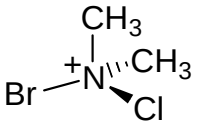
5) Wolff-Kishner reduction can be described as 'deoxygenation'.

6) Clemmensen reduction can be described as 'reduction'.

7) Aldehydes are more sterically hindered than ketones.

8) Cyclic acetals are formed when a diol reacts with a carbonyl compound under acidic conditions.

9) This ion is chiral:



10) Hoffman eliminations form a new π bond.

11-14) Circle the **strongest** base in each set.

11) BH_3 CH_4 NH_3 H_2O

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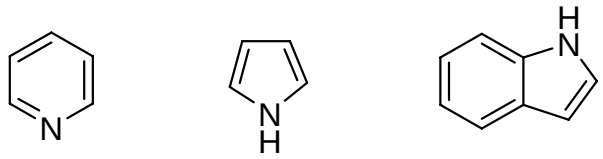

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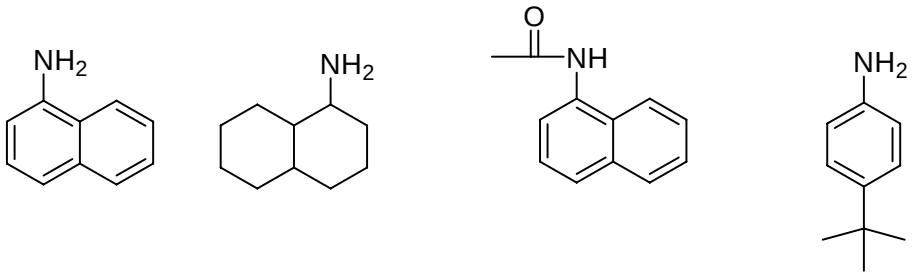

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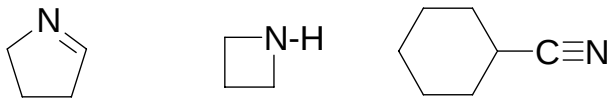
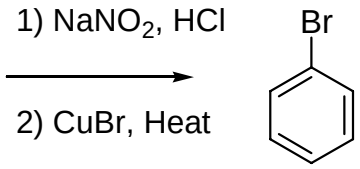
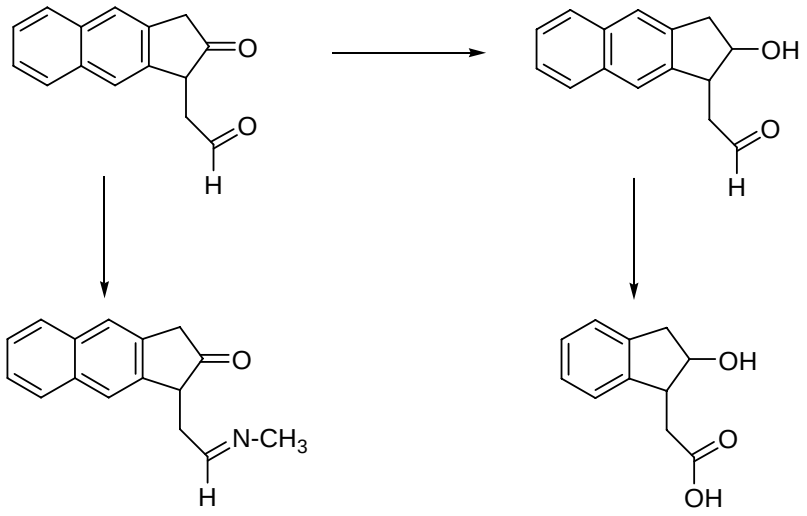


15) Draw in the correct starting material.



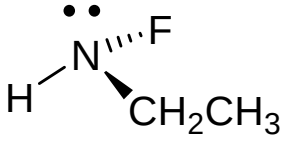
16-18) Give reagents for the following three transformations.



19 and 20) Draw the mechanism for the base catalyzed addition of water to an aldehyde.

**BONUS QUESTION for up to 2 points* *

Explain why this amine **cannot** be isolated as a single enantiomer even though it is chiral.



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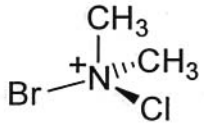

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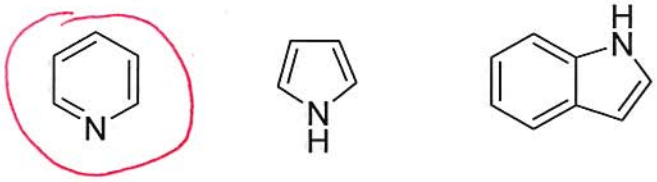

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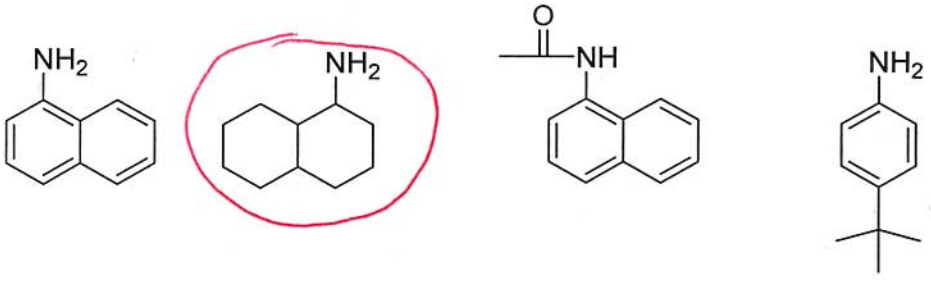

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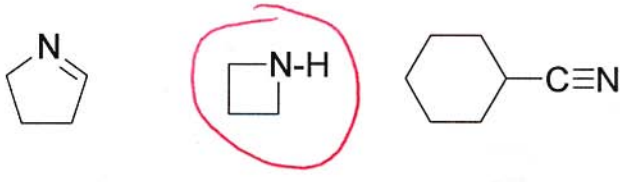

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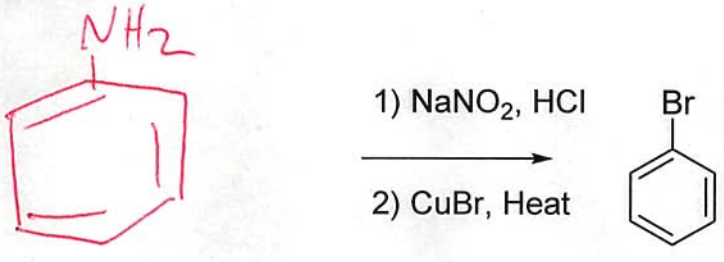

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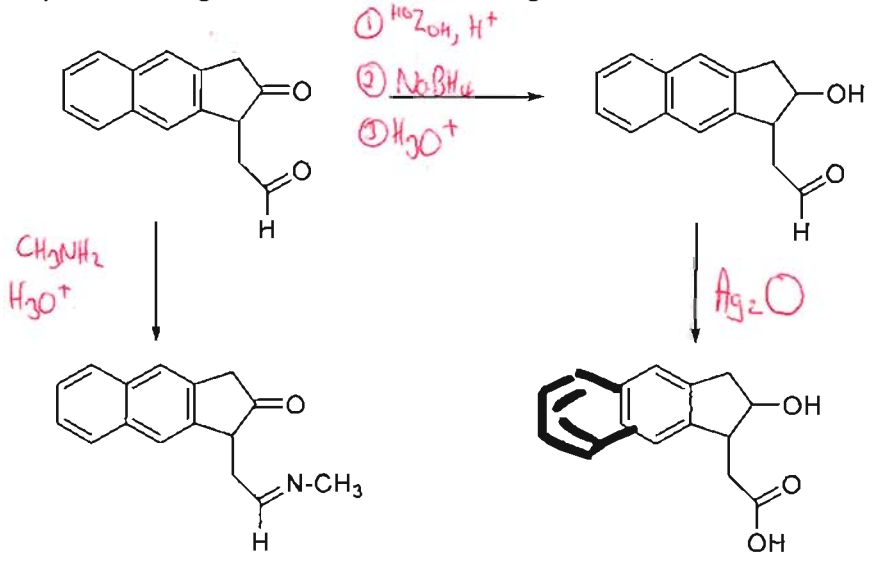

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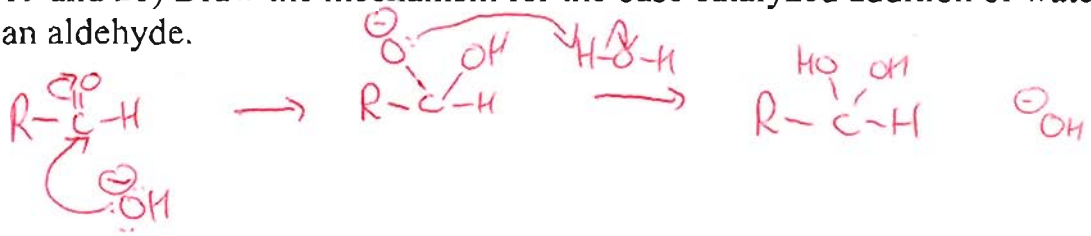

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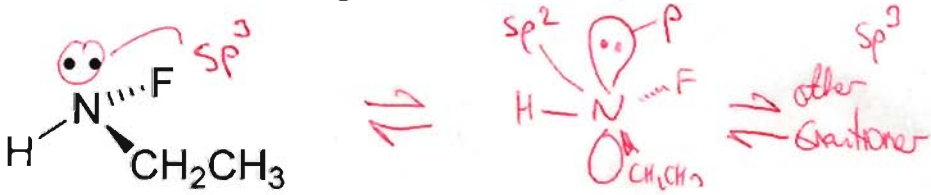

Even though this N has 4 different substituents, & is sp^3 hybridized it can undergo Nitrogen Inversion which causes racemization. The N can go from $sp^3 \rightarrow sp^2 \rightarrow sp^3$ if there is sufficient energy (ie. room temperature).