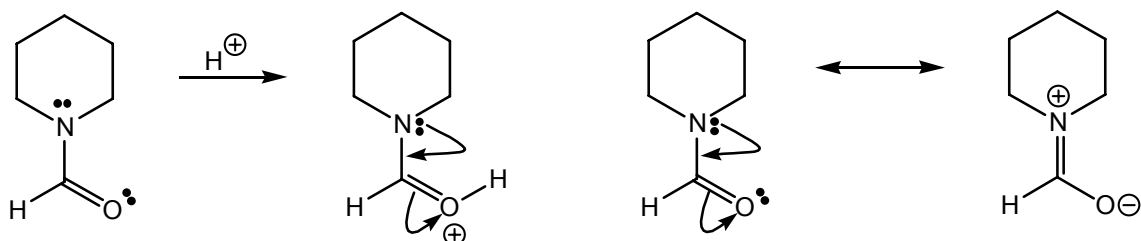
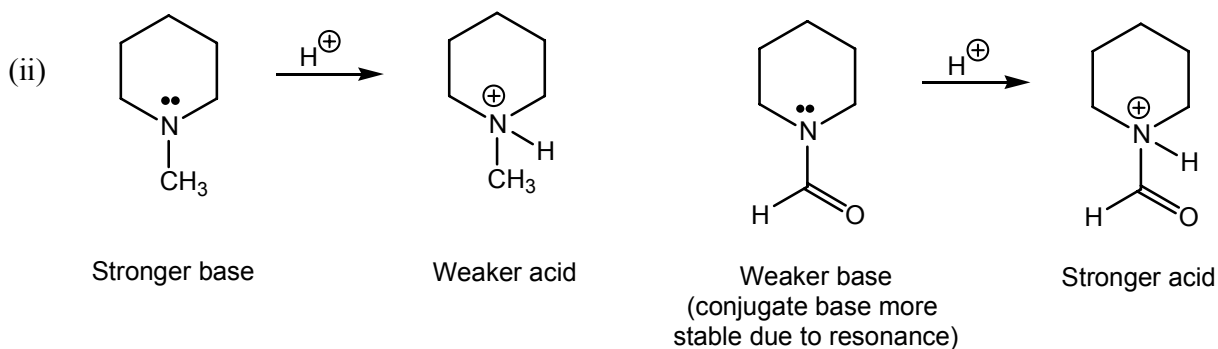
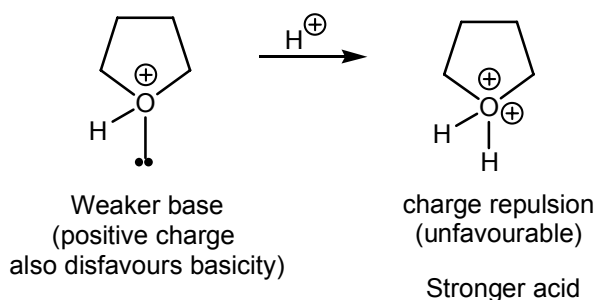
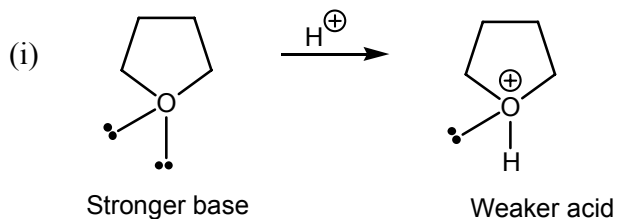


YOUR STUDENT NUMBER:

Year 2 Seminars, 06524, Semester 2, 2008
Heterocyclic Chemistry Test

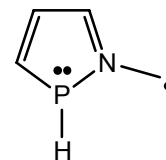
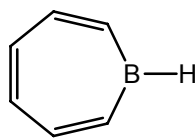
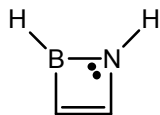
1. Answer *all* parts.

(a) For each of the following pairs of molecules, predict and explain which is the more basic.



(PTO)

(b) Which of the following molecules are aromatic, anti-aromatic or simply conjugated?



Note - each **boron** atom in the above structures have an EMPTY atomic p-orbital (with NO electrons)

Cyclic - YES

Cyclic - YES

Cyclic - YES

Planar - YES

Planar - YES

Planar - YES

Continuous conjugation - YES

Continuous conjugation - YES

Continuous conjugation - YES

Number of pi-electrons = 4

Number of pi-electrons = 6

Number of pi-electrons = 6

ANTI-AROMATIC ($4n$) $n = 1$

AROMATIC ($4n+2$) $n = 1$

AROMATIC ($4n+2$) $n = 1$

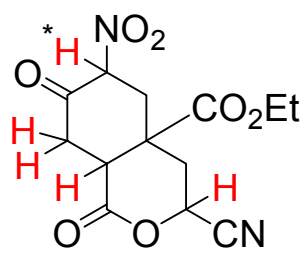
(PTO)

YOUR STUDENT NUMBER:

Year 2 Seminars, 06524, Semester 2, 2008
Bifunctional Chemistry Test

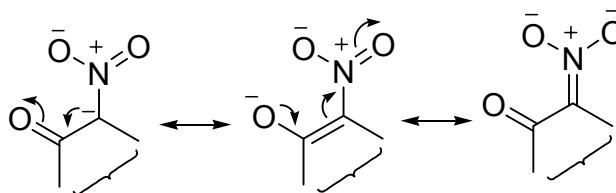
2. Answer *all* parts.

- (a) Mark on the following diagram **all** of the acidic hydrogen atoms in compound **A** and indicate clearly, with a brief explanation, which is the most acidic.

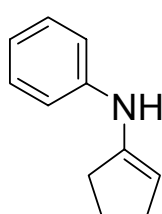


A

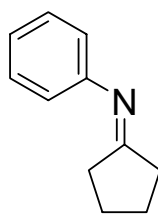
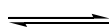
* Most acidic as it forms a stable conjugate base due to delocalization of charge over C=O and NO₂ group.



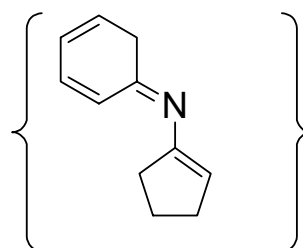
- (b) Draw a tautomeric form of the compound **B**.



B



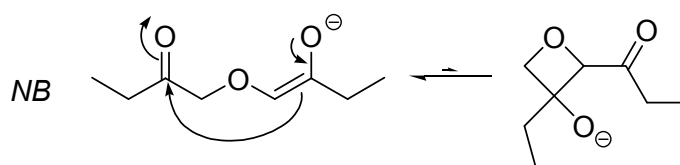
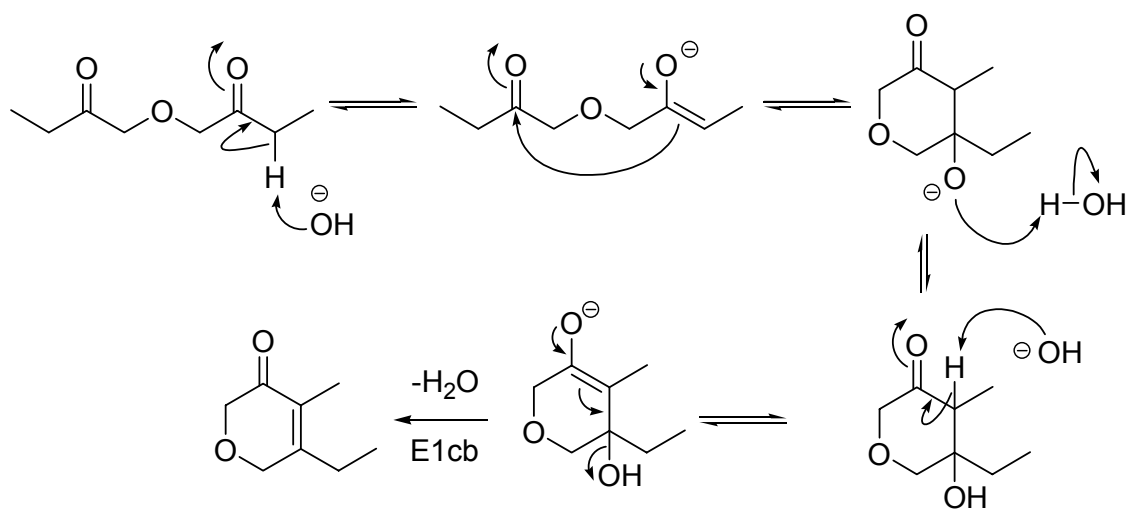
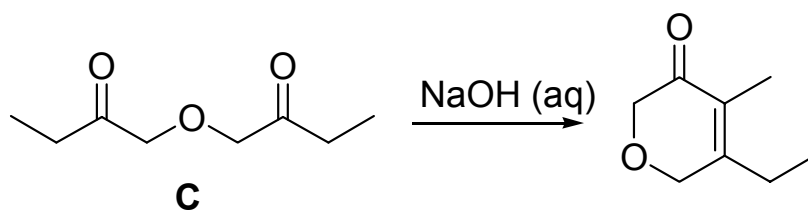
tautomer



insignificant tautomer
(lost aromaticity)

(PTO)

(c) Rationalise the formation of the product in the following reaction of ketone **C**.



unfavourable due to ring strain

(end)