

**DEPARTMENT OF MEDICINAL CHEMISTRY
SCHOOL OF PHARMACY**

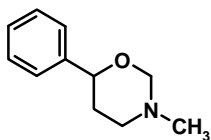
Medicinal Chemistry I
Dr. Umesh R. Desai

MEDC 501
October 11, 2007

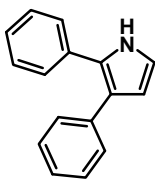
STUDENT NAME	HONOR PLEDGE
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Ring Size	Saturated	Partly Saturated	Unsaturated
3	-irane	-	-irene
4	-etane	(dihydro)	-ete
5	-olane	(dihydro)	-ole
6	-inane	(di or tetrahydro)	-ine
7	-epane	(di, tetra, or hexahydro)	-epine
8	-ocane	(di, tetra, or hexahydro)	-ocine

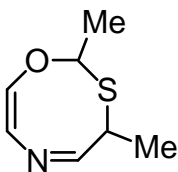
1. Write the systematic name for the following heterocycles. (12 pts)



3-methyl-6-phenyl-[1,3]-oxazinane



2,3-diphenyl-1H-azole



2,4-dimethyl-2H,4H-[1,3,6]-oxathiazocine

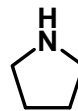
2. Rank the following according to their stability to ring opening conditions, e.g., high temperature, strong acids, etc. Use 1 for least stable and 3 for most stable. **NOTE: The entire sequence has to be correct, otherwise zero points.** (3 pts)



2



1

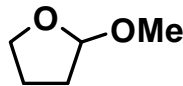


3

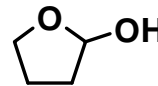
3. Rank the following according to their stability to acidic conditions, e.g., H₂O/H⁺. Use 1 for least stable and 3 for most stable. **NOTE: The entire sequence has to be correct, otherwise zero points.** (3 pts)



3



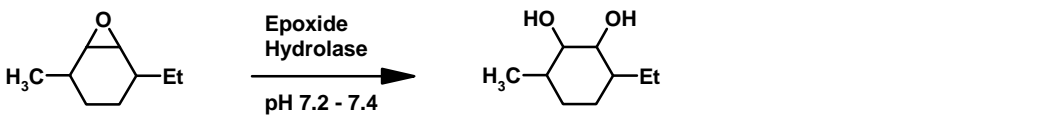
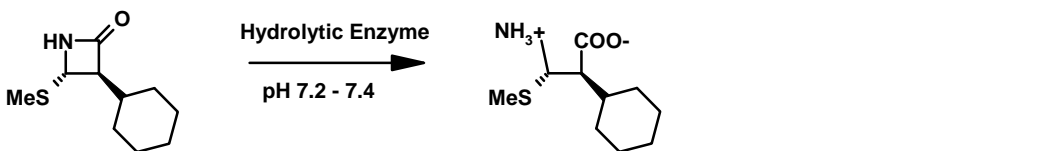
2



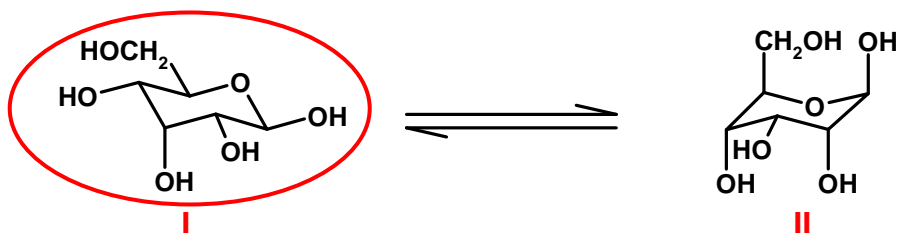
1

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4. Draw the structure of products formed in the following reactions. If no product is formed, write none (8 pts)

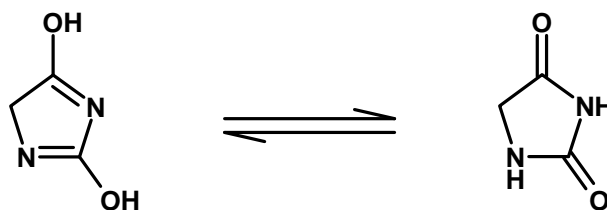


5. Following is a chair form of a monosaccharide. Draw its conformational isomer that might exist in equilibrium. Circle the conformation that is expected to be more stable. Justify your choice in not more than 2 or 3 sentences. (3+1+2 pts)



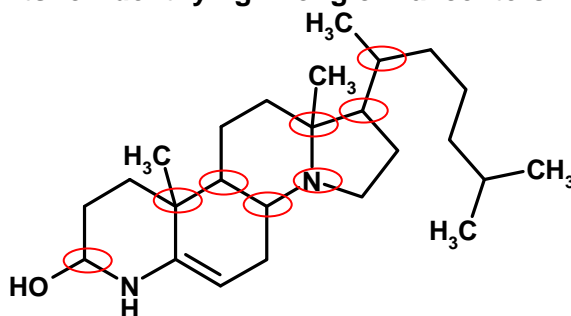
The identified conformation is expected to be more stable because it has least number of 1,3-diaxial interactions. For example, in conformation II, three -OH groups and one -CH₂OH group are axial thereby generating considerable 1,3-diaxial repulsion. In contrast, conformation I has only one -OH group axial resulting in much less 1,3-diaxial repulsion.

6. For the structure below, draw the appropriate tautomer that may exist in equilibrium. What is this tautomerism called? (3+1 pts)



KETO - ENOL TAUTOMERISM

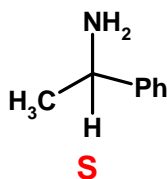
7. Circle each chiral center in the following molecule. **Note: Each chiral center should have only one atom. Negative points for identifying wrong chiral centers.** (4 pts)



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8. What is the Cahn-Ingold-Prelog identification (the R or S form) of the following stereoisomer?

(4 pts)



9. Whereas conformational isomers can be obtained by mere rotation around single bonds, to interconvert configurational/geometric isomers one has to break bonds.

(2 pts)

10. Clearly define the following terms.

(4 pts)

Enantiomers : **Mirror image stereoisomers that are non-superimposable**

Diastereomers: **Pair of stereoisomers containing more than one chiral center that are not related as mirror image isomers**