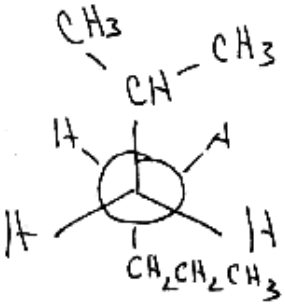
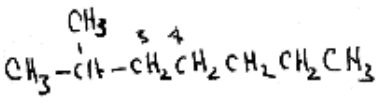
Chemistry 3311-100
Organic Chemistry/Dr. Barney Ellison
Thursday: Feb. 15 @ **7:00pm → 9:00**/1st Exam/Math 100

Name: Key (please print)

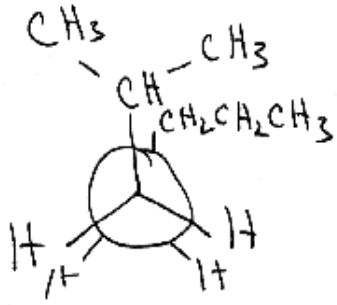
1. (10 pts) Consider rotation about the (C-3)—(C-4) bond of 2-methylheptane.

a) draw the Newman projection of the most stable conformer

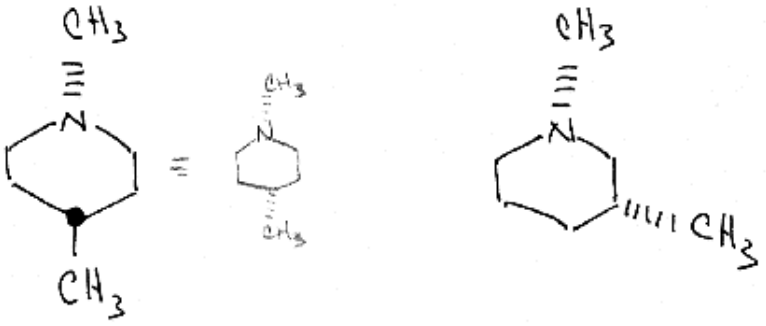


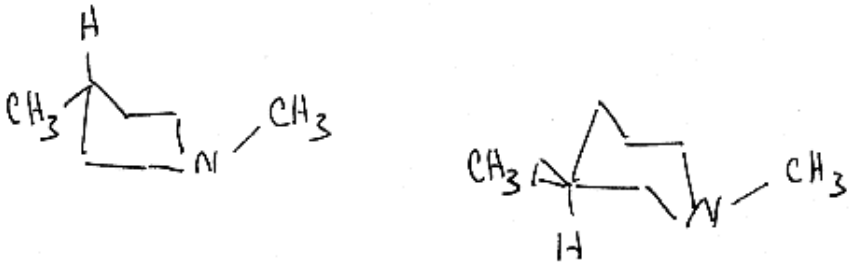


b) draw the Newman projection of the least stable conformer

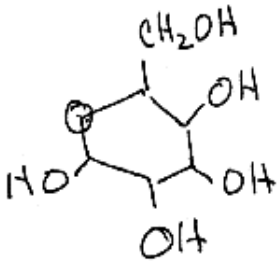


2. (10 pts) Draw the most stable conformer for each of the isomeric N-methylpiperdines.

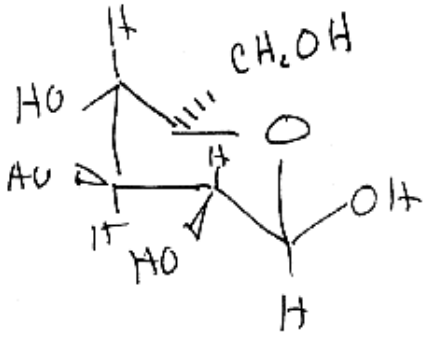




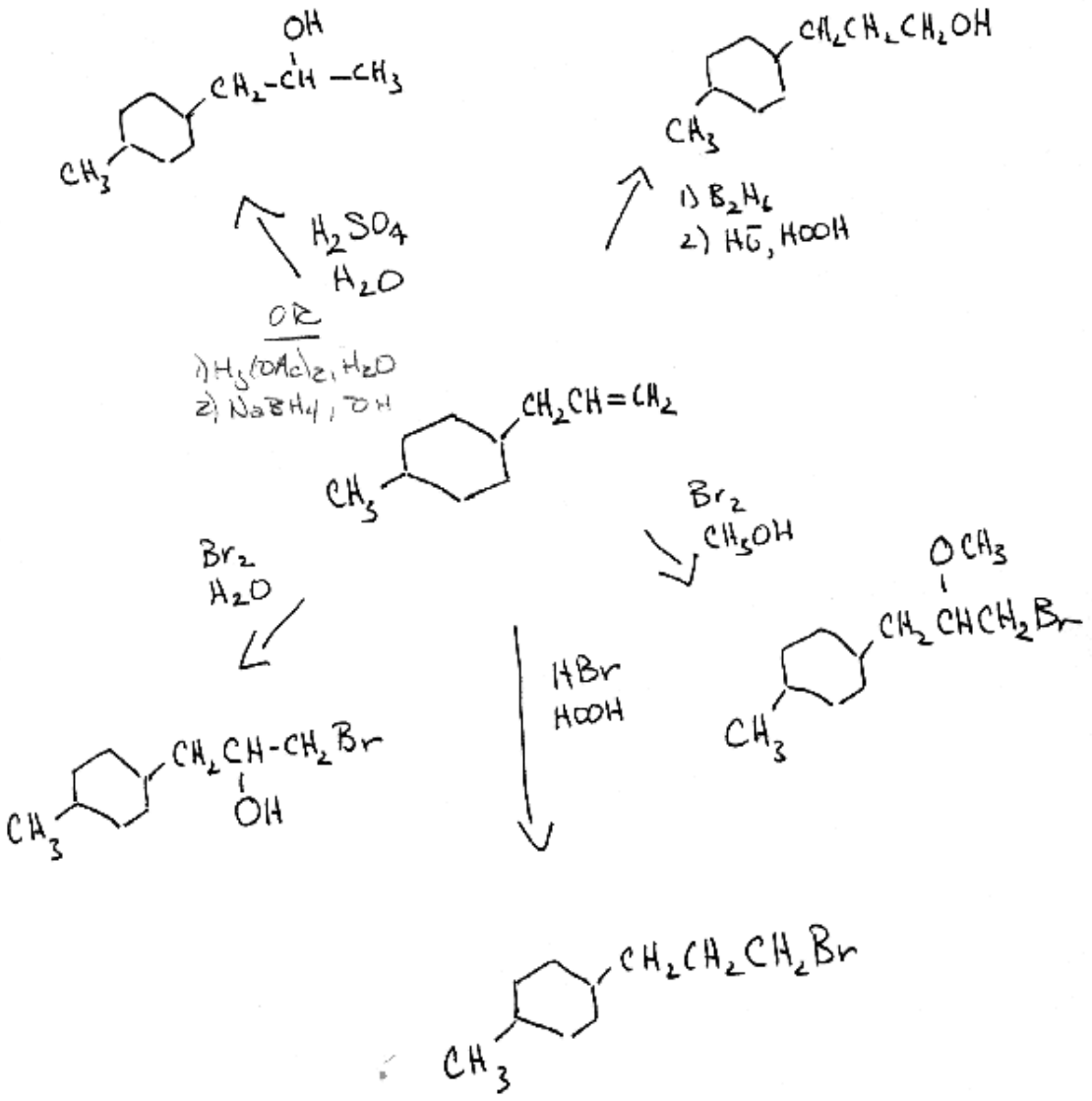
3. (10 pts) The most stable form of glucose (blood sugar) is a six-membered ring in a chair conformation. Starting with the chair structure, complete the diagram to indicate the most stable form of glucose.



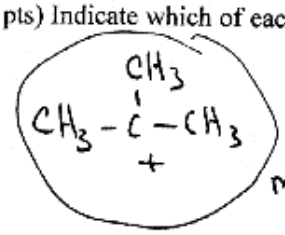
All equatorial:

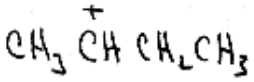


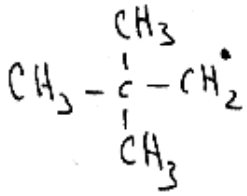
4. (20 pts) Give the reagents that would be required to carry out the following syntheses.

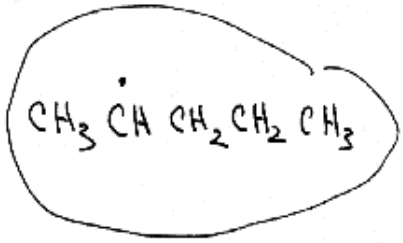


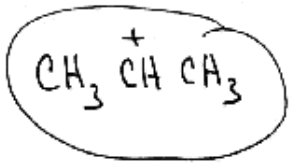
5. (10 pts) Indicate which of each pair is the more stable species.

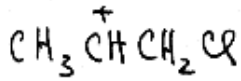
a)  most stable

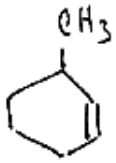


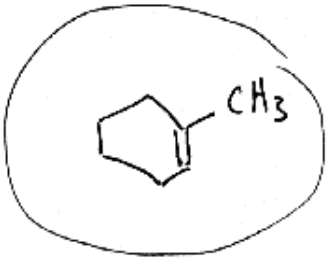
b) 

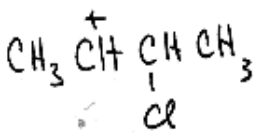


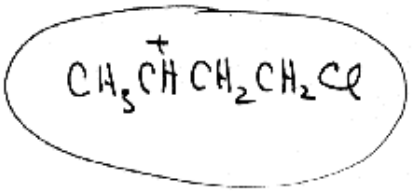
c) 



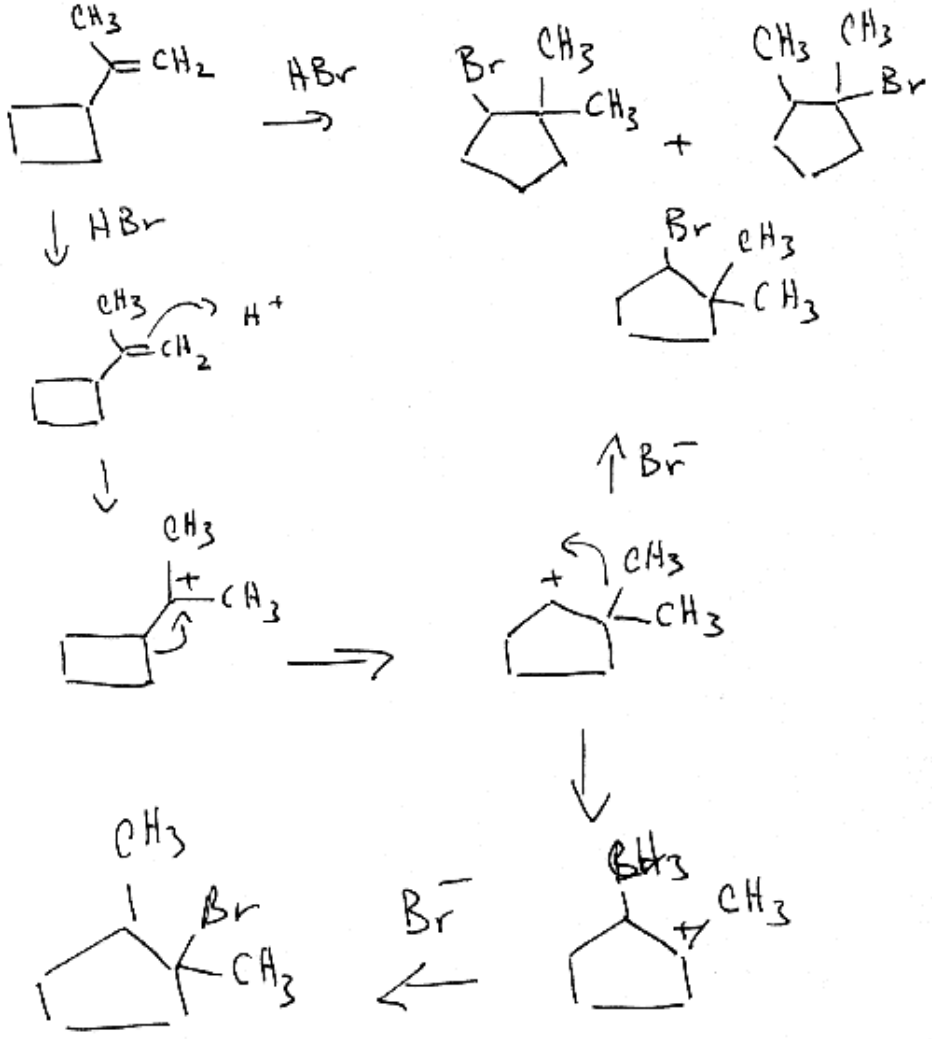
d) 



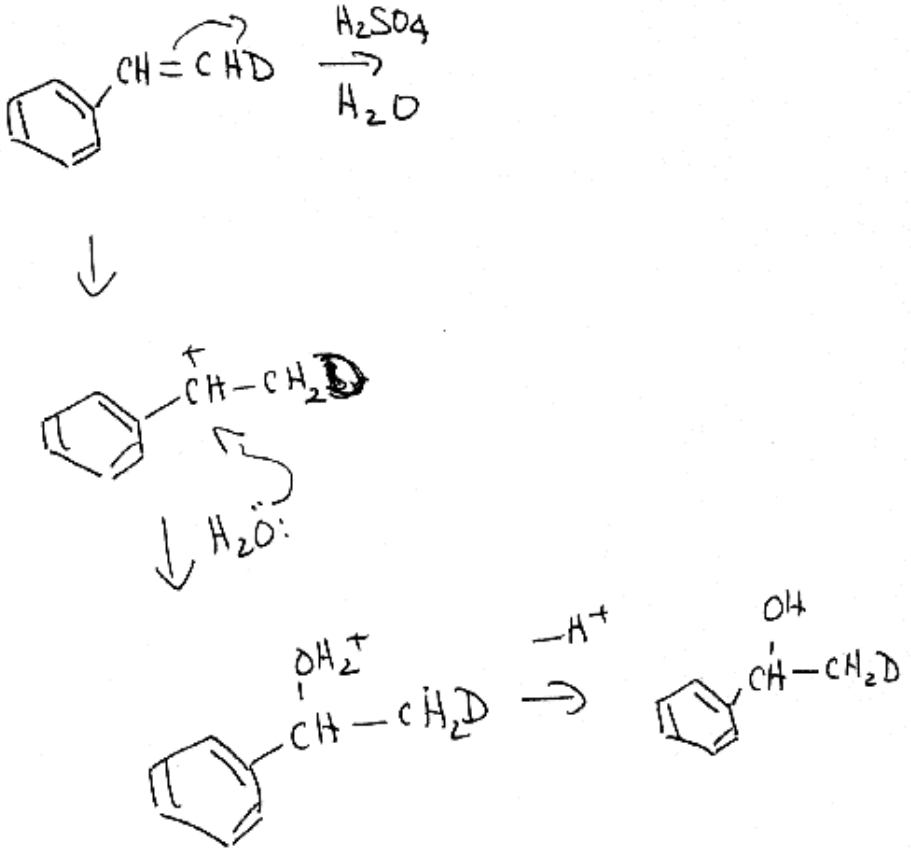
e) 



6. (10 pts) Propose a mechanism for the following reaction.

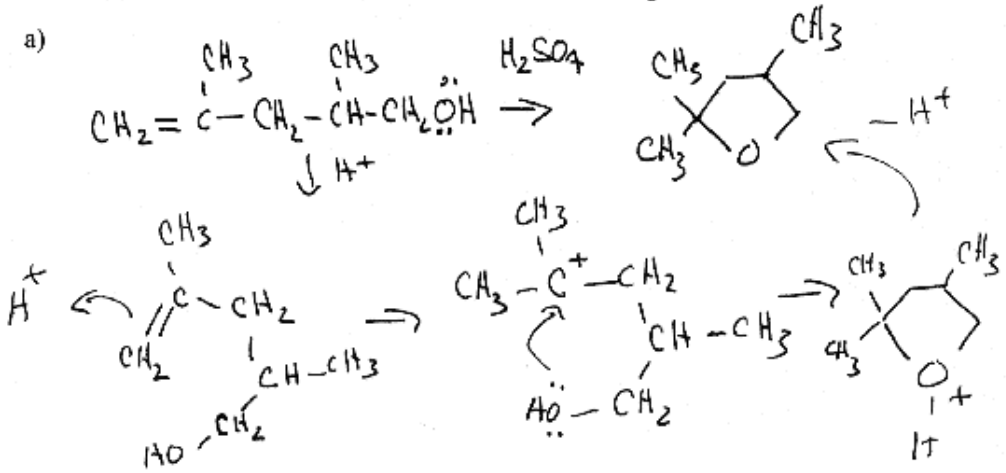


7. (10 pts) When the following compound is hydrated in the presence of acid, what is the product? What is the mechanism of the reaction?

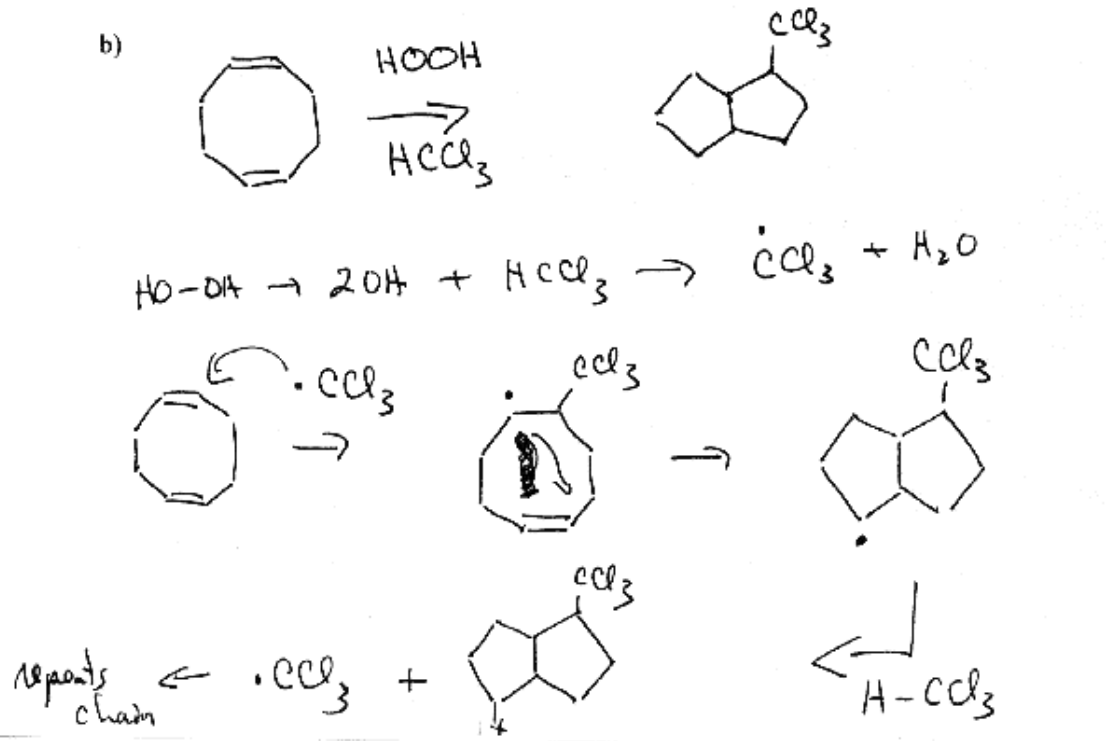


8 (20 pts) Propose a mechanism for each of the following reactions.

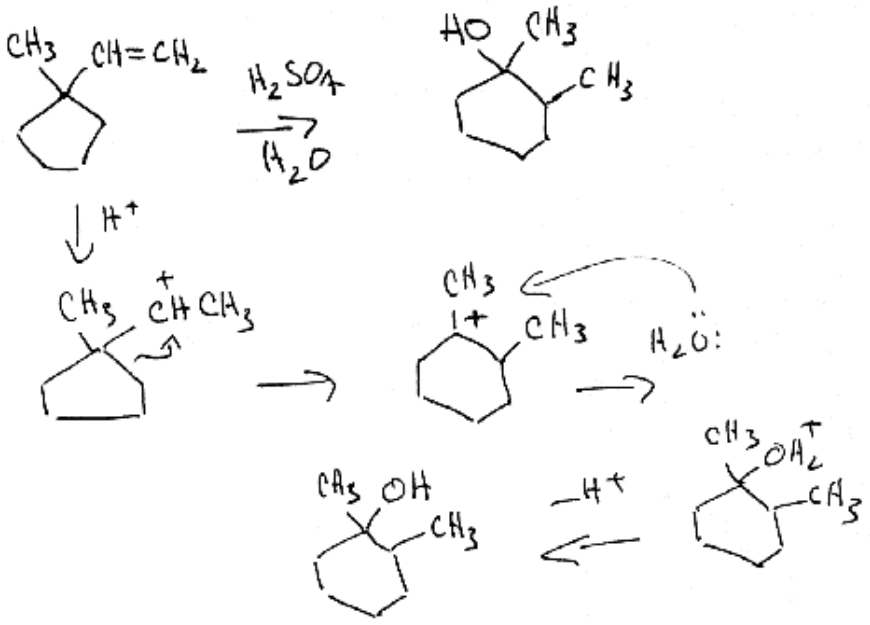
a)



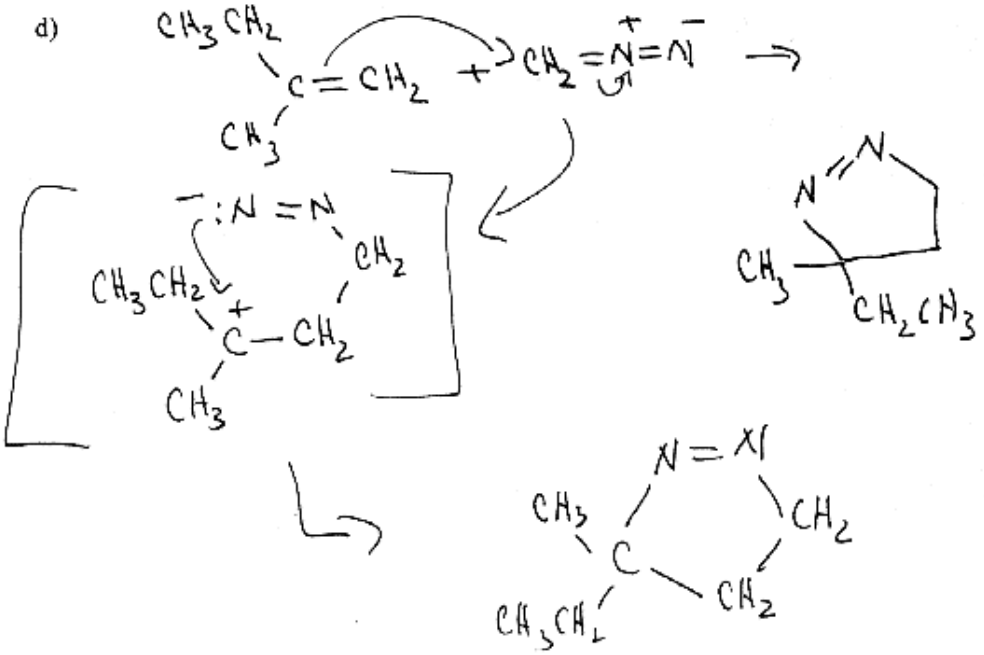
b)



c)


CH3 CH=CH2
H2SO4
H2O
HO CH3
CH3
H+
CH3 CH CH3
CH3
CH3
H2O:
CH3 OH2+
CH3
CH3 OH
CH3
-H+

d)


CH3CH2
C=CH2
CH3
CH2=N=N
:N=N
CH2
CH3CH2
C
CH2
CH3
N
N
CH3
CH2CH3
N=N
CH3
C
CH2
CH2
CH3CH2