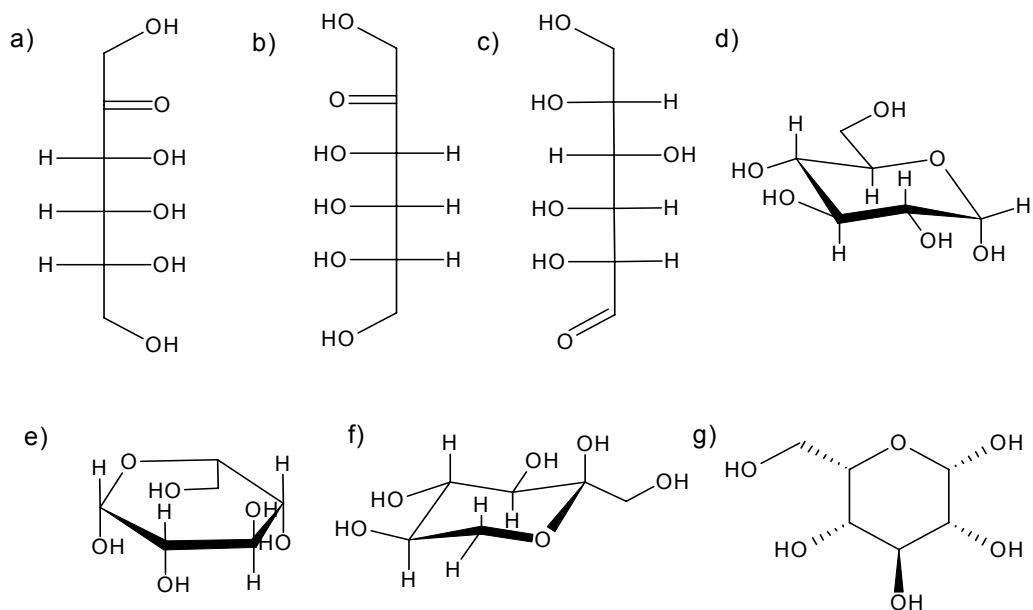
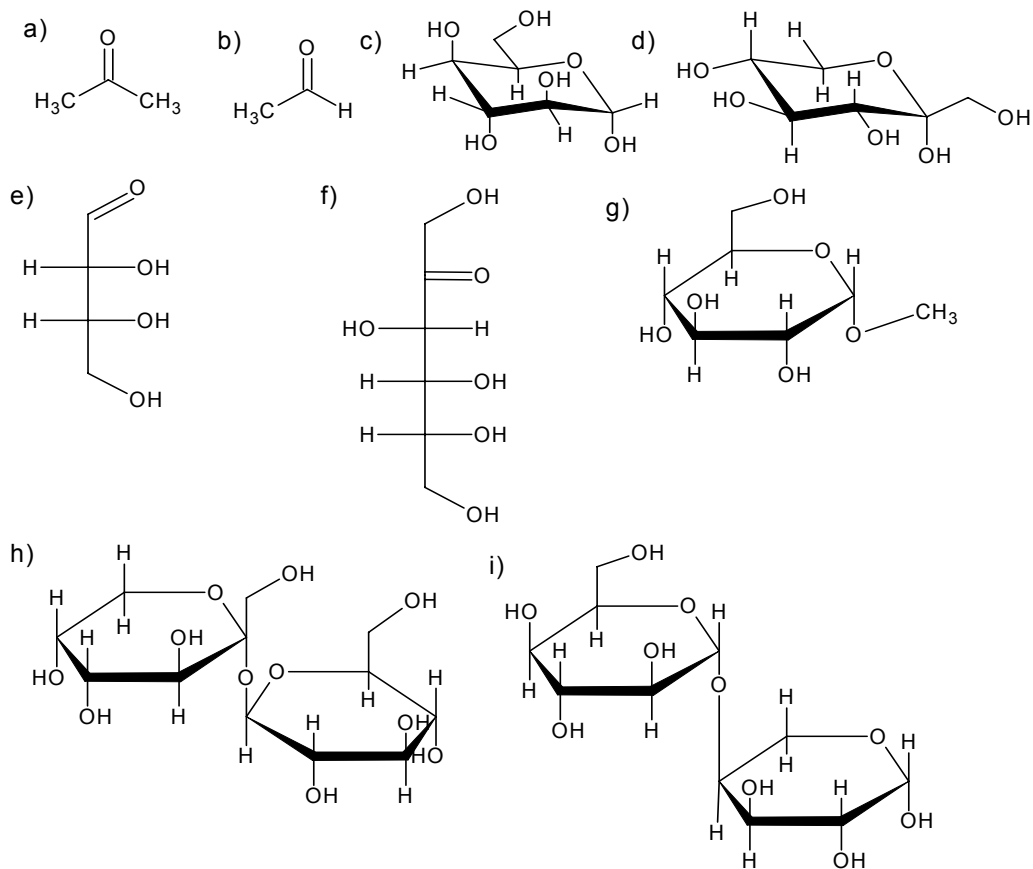


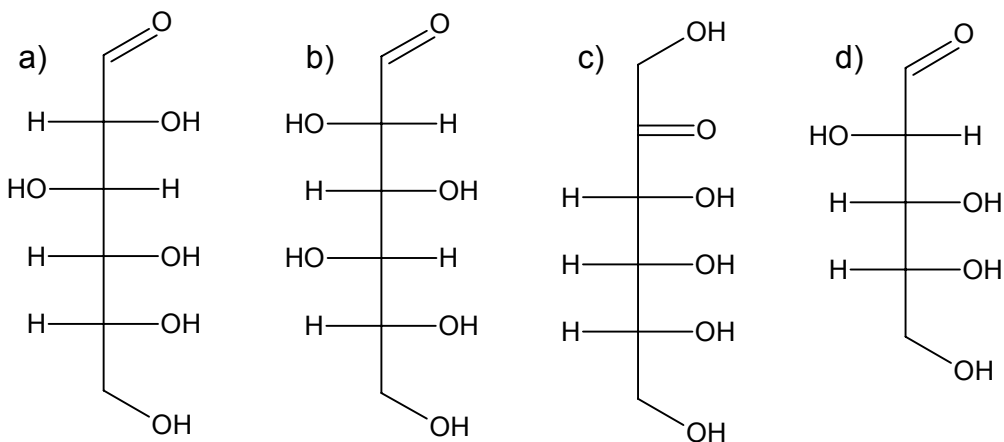
1. Determine whether the following sugars are D or L



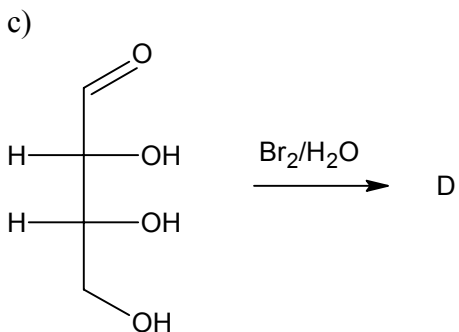
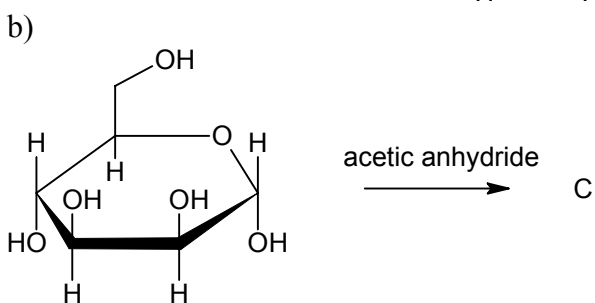
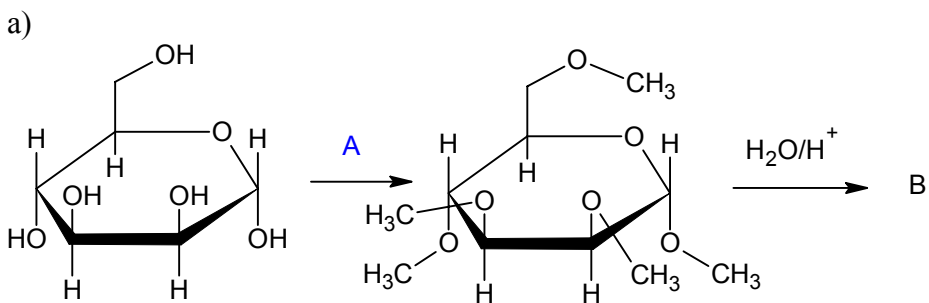
2. Determine whether the following compounds are Tollen's negative or Tollen's positive.



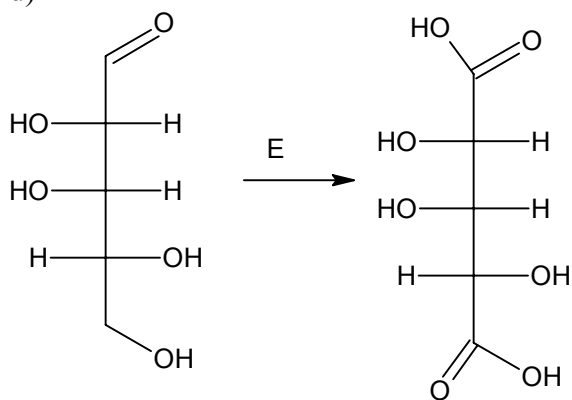
3. Draw the  $\beta$  cyclopyranose forms of the following sugars.



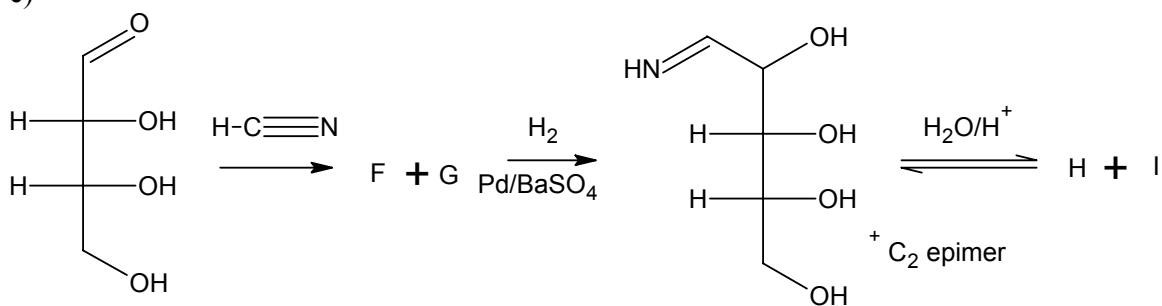
4. Fill in the blanks in the following reactions.



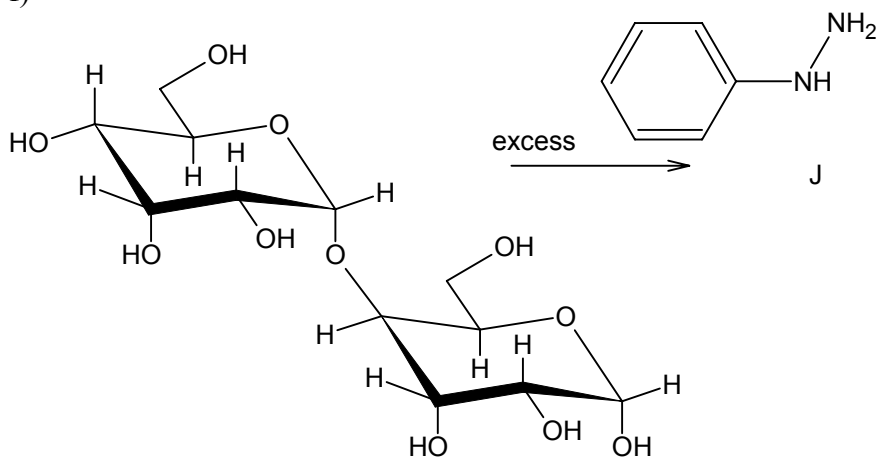
d)



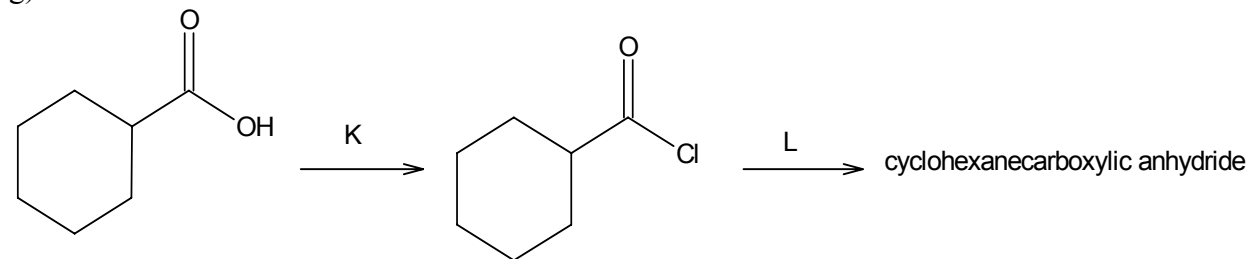
e)



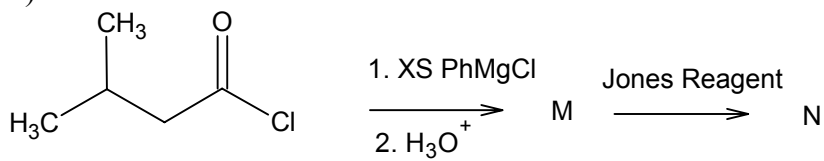
f)



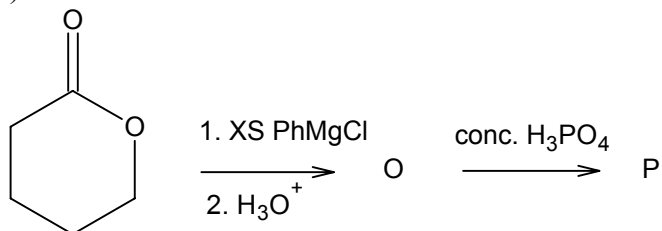
g)



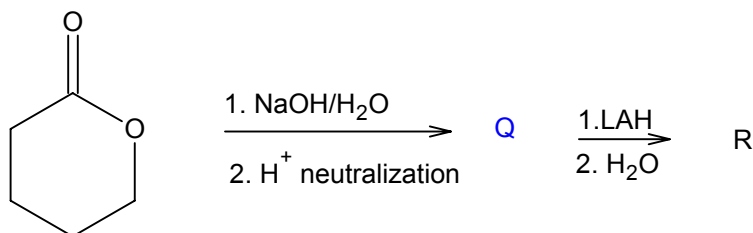
h)



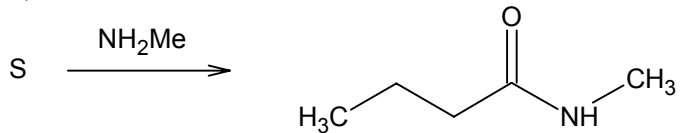
i)



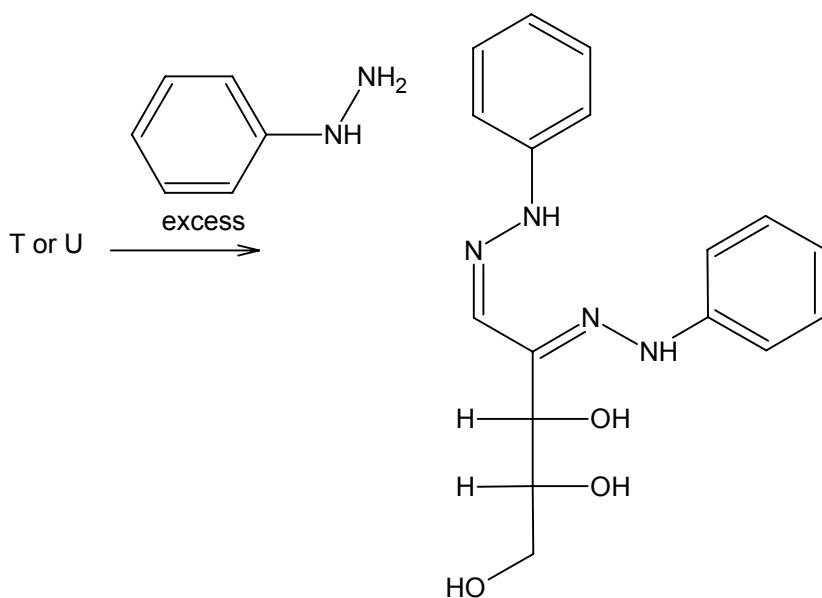
j)



k)

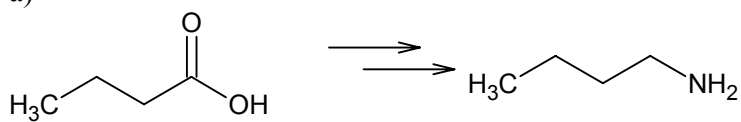


l)

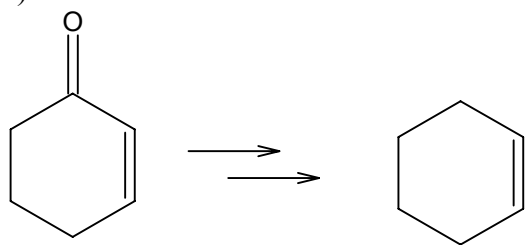


5. Propose a synthesis.

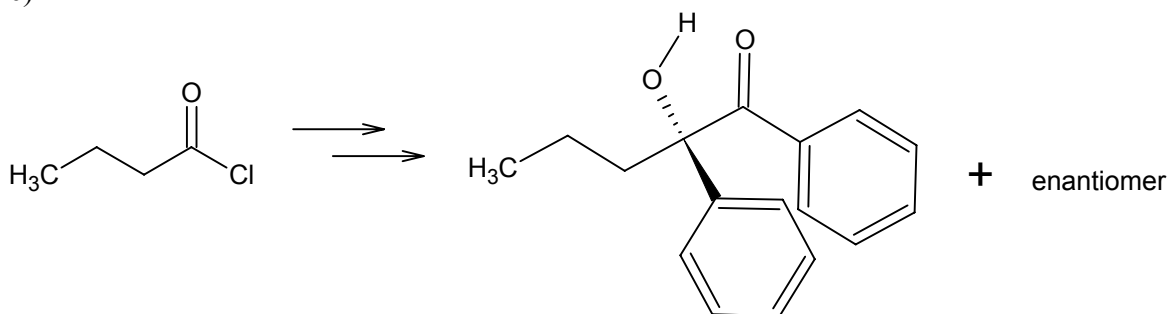
a)



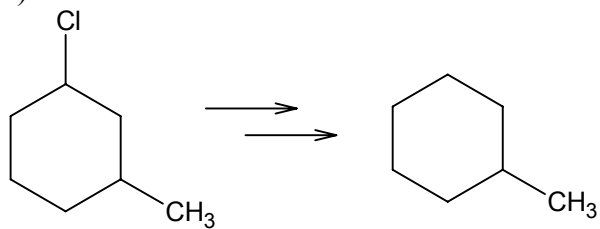
b)



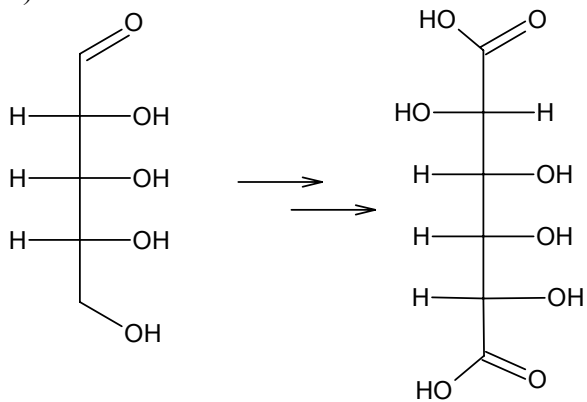
c)

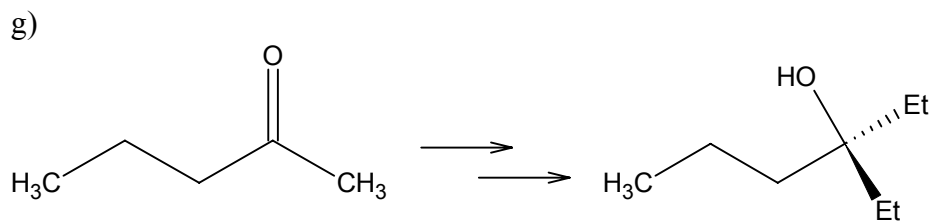
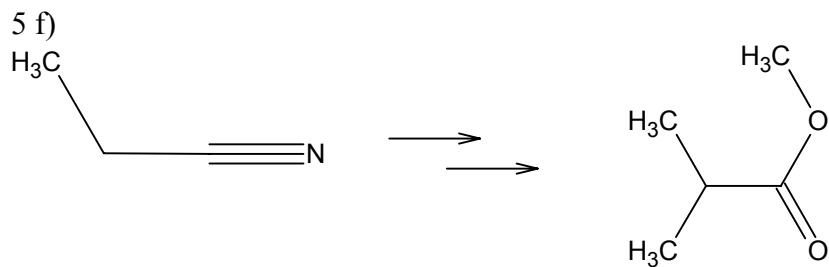


d)



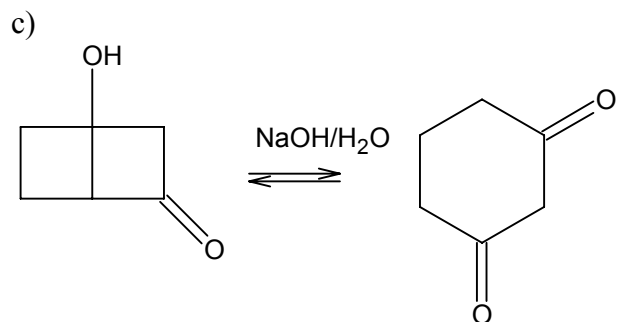
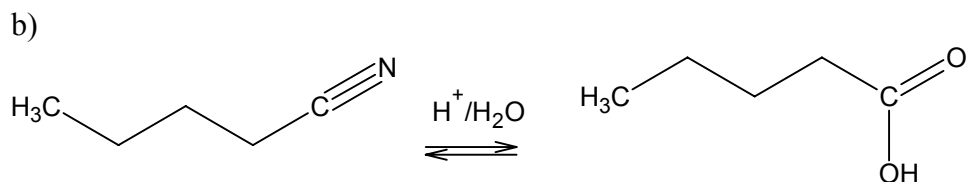
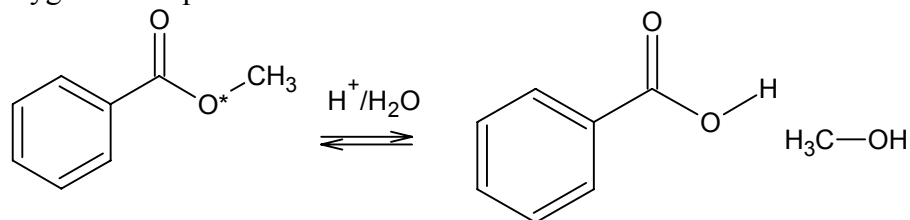
e)





6. Propose a Mechanism.

a) An oxygen has been marked with a star. You must demonstrate with a star where this oxygen ends up.



## 7. Roadmap Problem

a)

An unknown compound A has formula  $C_5H_{11}N$  and possesses no NH single bonds. When A is hydrolyzed in aqueous acid and then neutralized, two products are formed, namely B ( $CH_5N$ ) and C ( $C_4H_8O$ ). Compound C does not have a positive Tollen's test and is not oxidized by the Jones Reagent. However, C does react with  $NaOH/Cl_2$  to give  $CCl_3H$  and sodium propanoate. Determine the unknown structures.

b)

Two unknowns A, and B both have the formulas  $C_4H_8O_4$ . A and B react with excess phenylhydrazine to produce the same molecule. When A is subjected to the action of HCN, followed by treatment with  $H_2/Pd/BaSO_4$ , the result is two compound C and D which are diastereomeric. Treatment of C and D with dilute  $HNO_3$  yields two compounds, one of which is achiral and one of which is chiral, respectively. If C and D are both "D" type monosaccharides then determine possible structures of A through D.