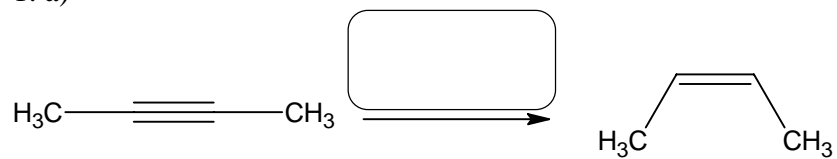
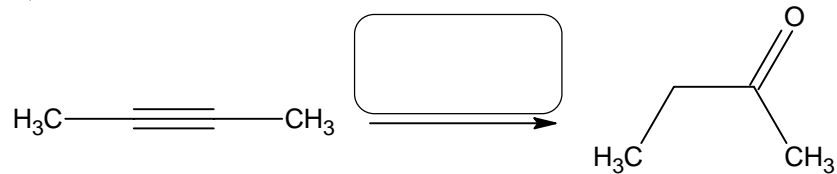


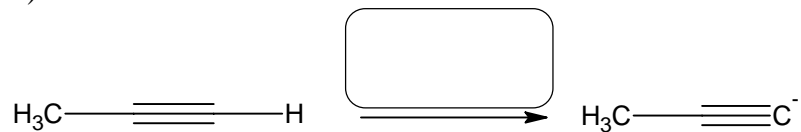
1. a)



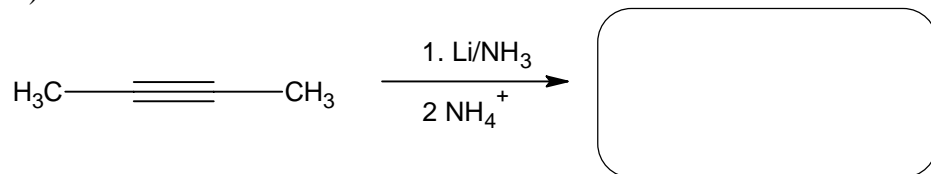
b)



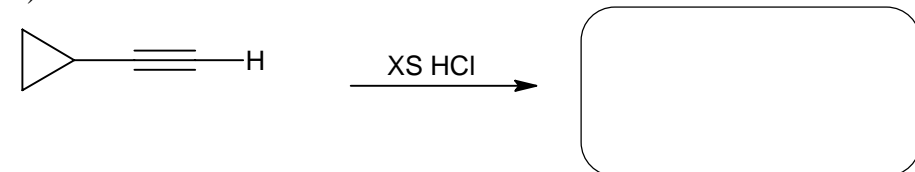
c)



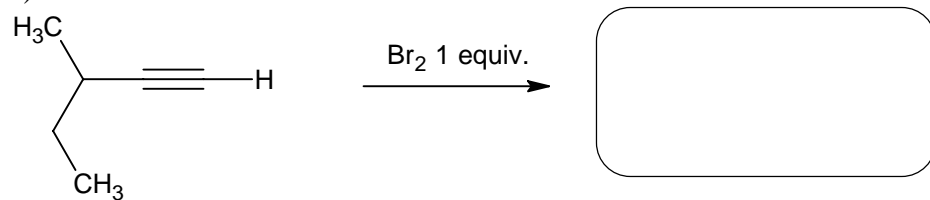
d)



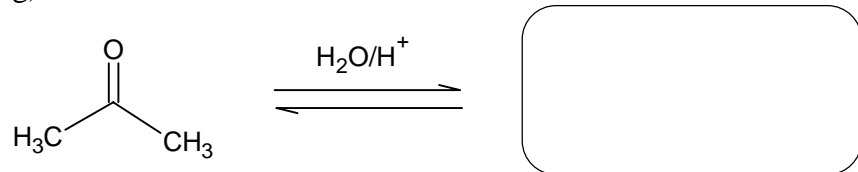
e)



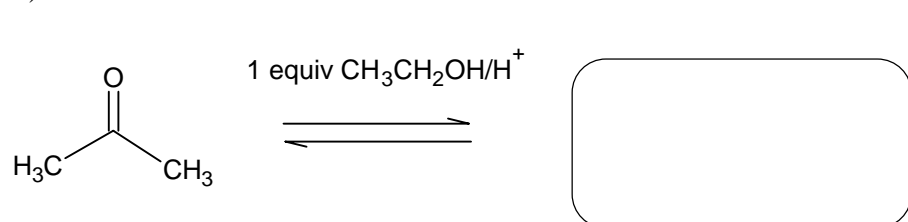
f)

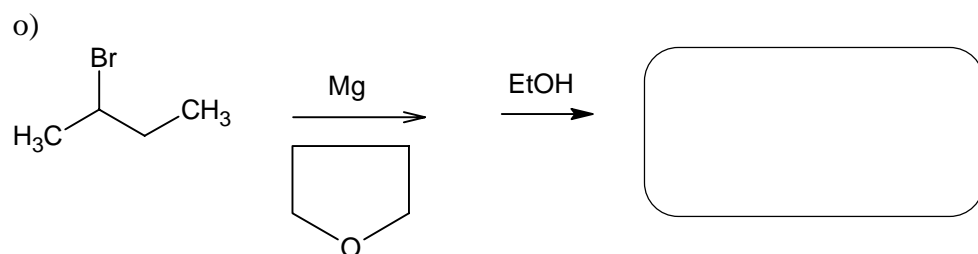
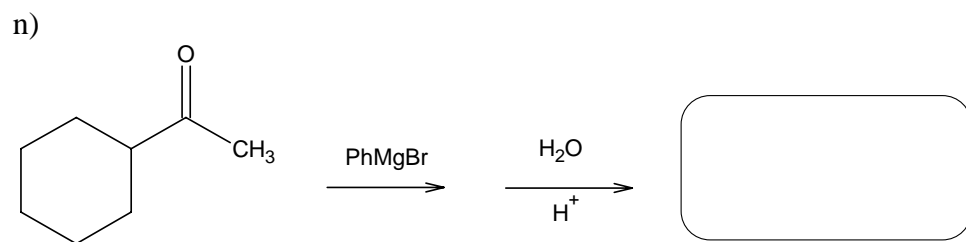
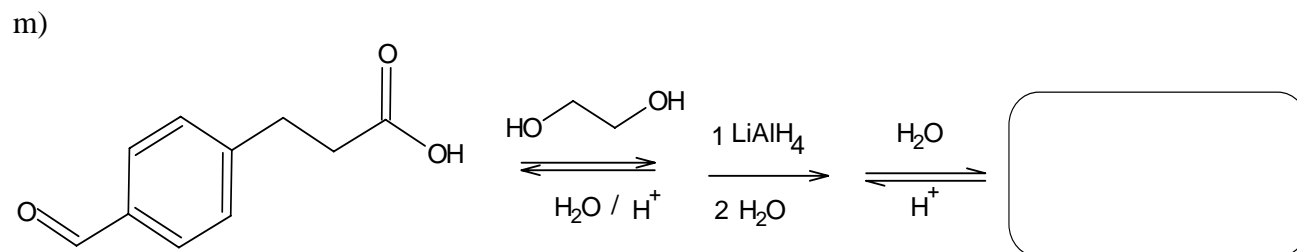
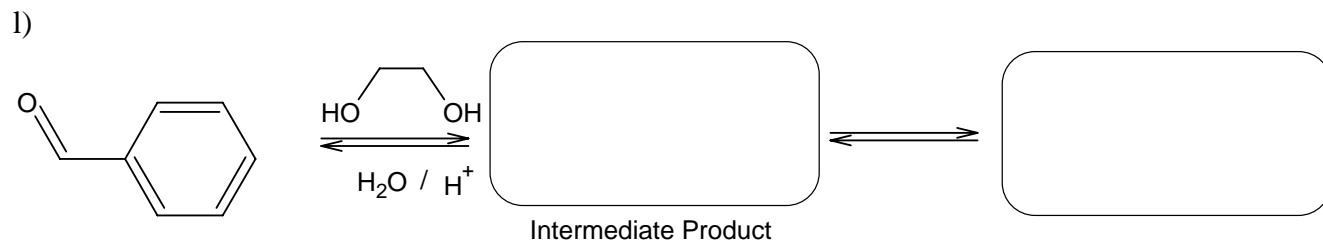
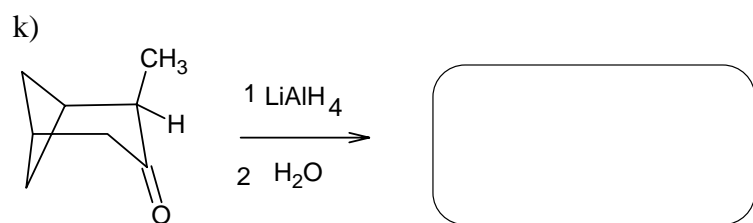
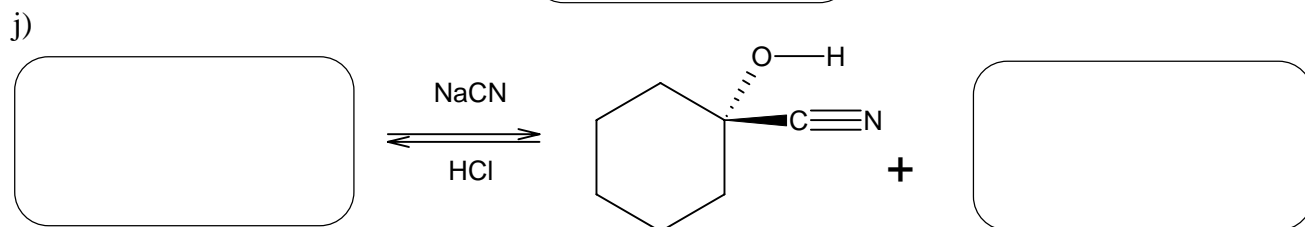
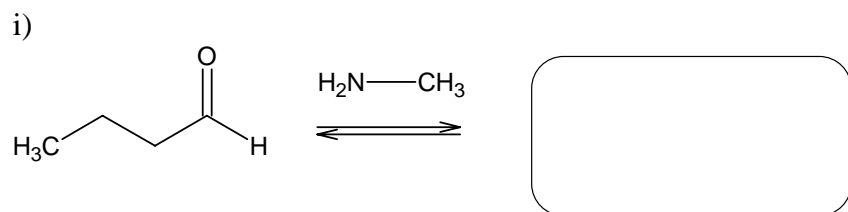


g)

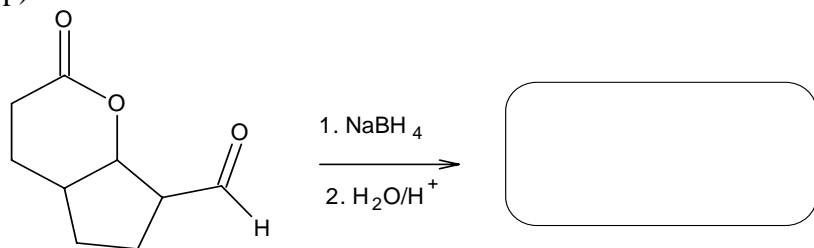


h)

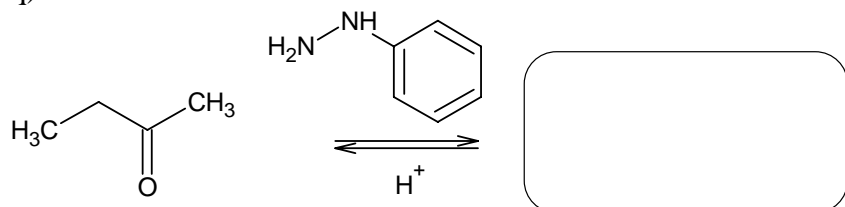




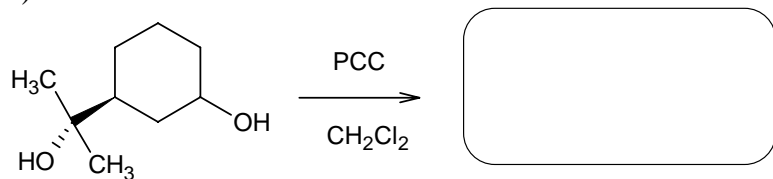
p)



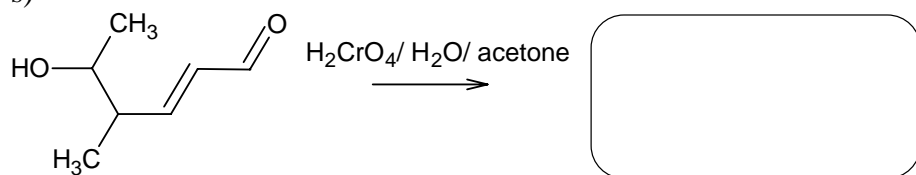
q)



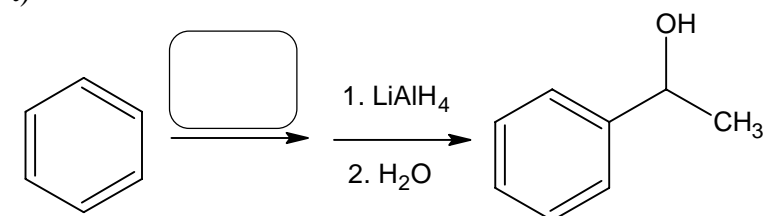
r)



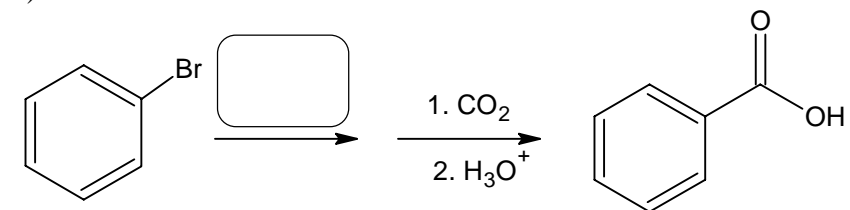
s)



t)



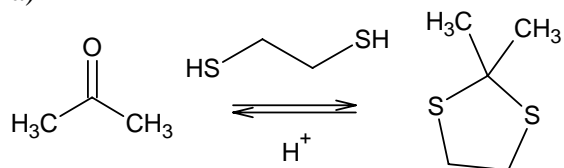
u)



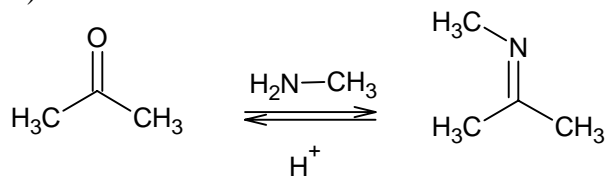
## 2. Propose a Mechanism.

(If the reaction is reversible show the mechanism for the forward transformation only)

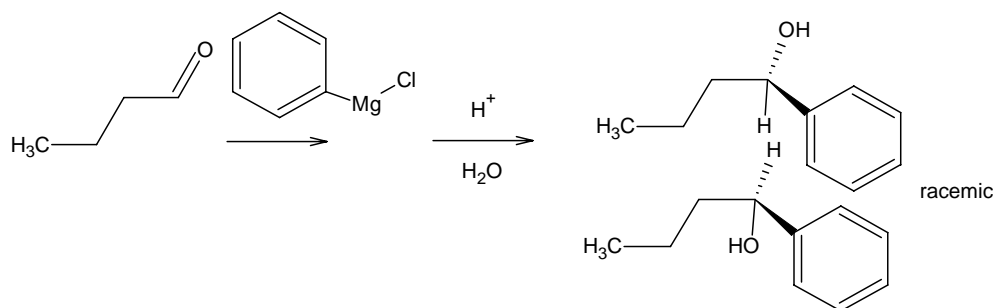
a)



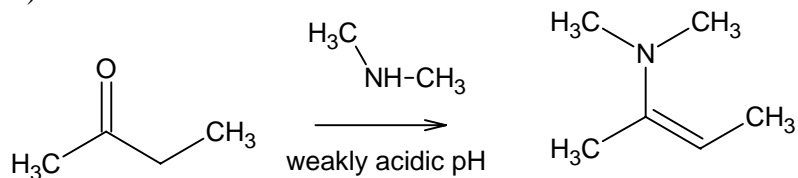
b)



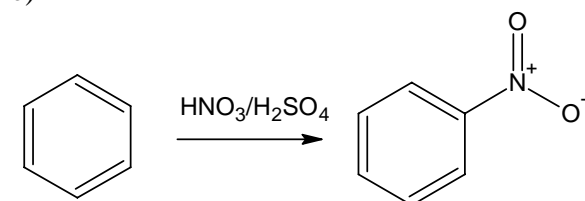
c)



d)

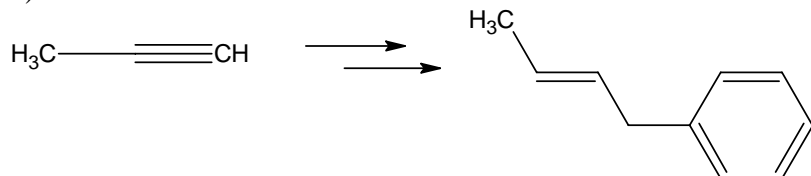


e)

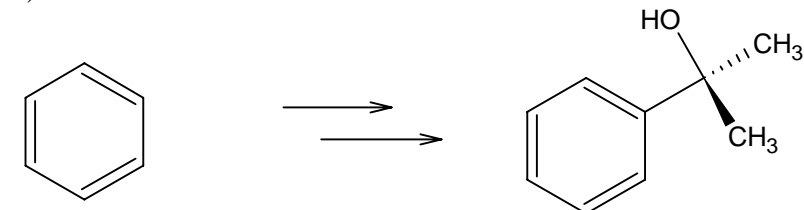


### 3. Propose a Synthesis

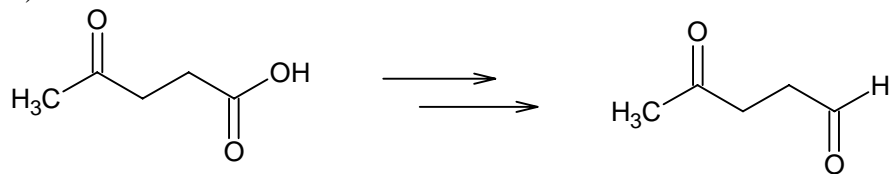
a)



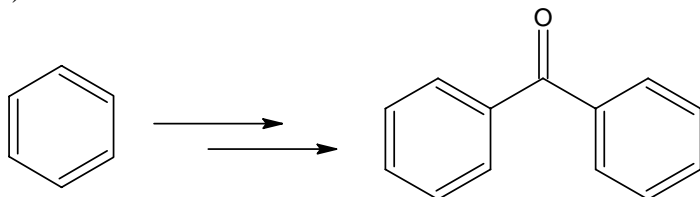
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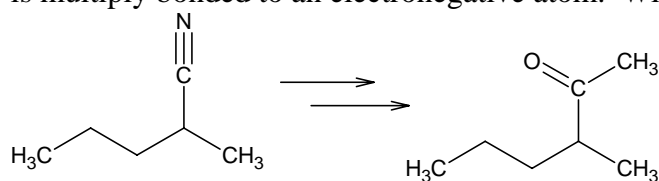
c)



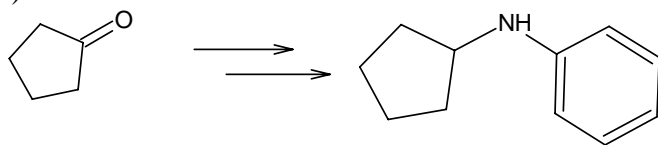
d)



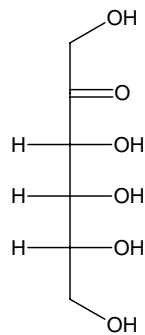
e) Consider the fact the CN group behaves in many ways very much like a carbonyl. It is comprised of a carbon that is multiply bonded to an electronegative atom. With this in mind show how to make the following transformation.



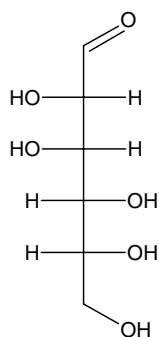
f)



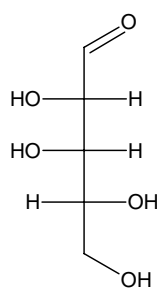
4. Draw the cyclized form of each sugar in the specified manner.



$\beta$ -cyclofuranose

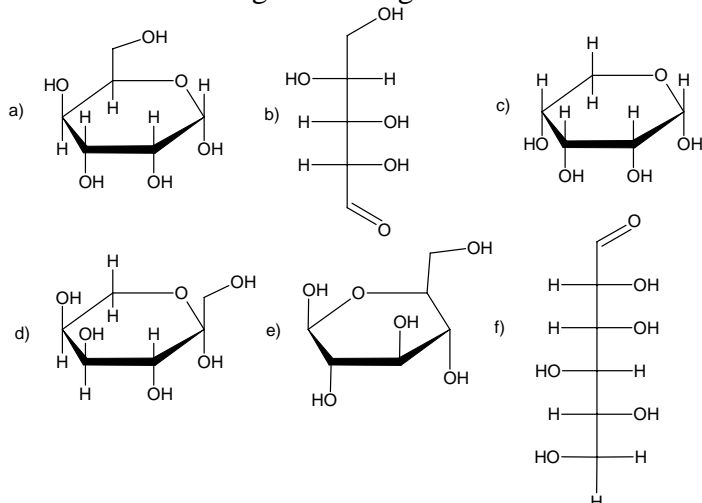


$\alpha$ -cyclopentopyranose



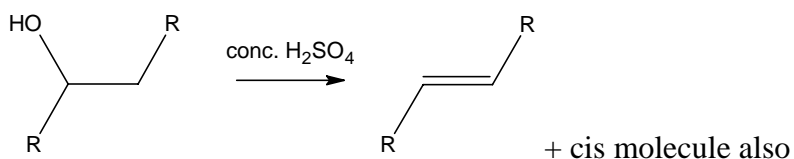
$\beta$ -cyclopentopyranose

5. Are the following D or L sugars?

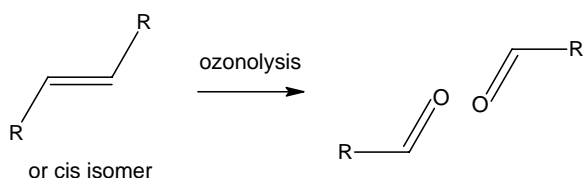


6. RoadMap Question

You may recall (or may have never learned) the following two reactions that you will need for this question. The first is the dehydration of alcohols to alkenes by the use of concentrated sulphuric acid.



The second reaction we will just call “ozonolysis” which cuts alkenes in half at the double bond and inserts two carbonyls.



Using these reactions and the information below, determine possible structures of the unknown molecules A through E. The formula for A is  $\text{C}_6\text{H}_{12}\text{O}$ .

