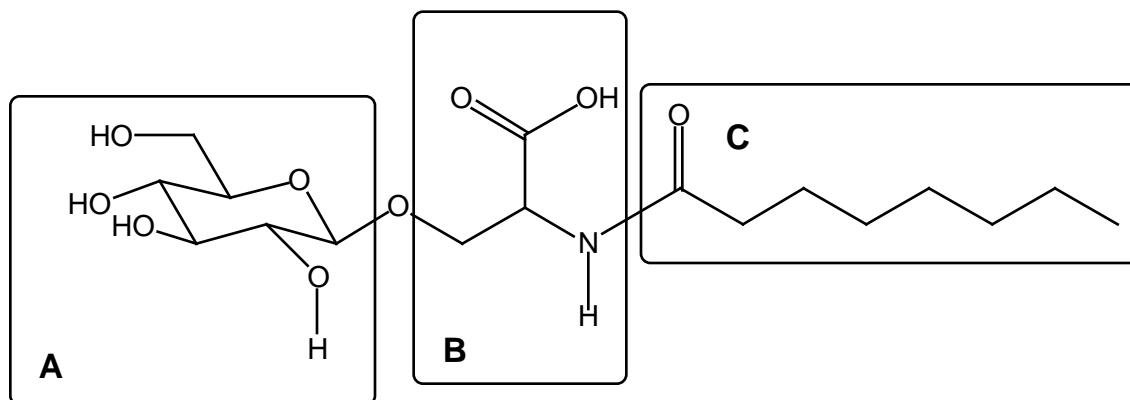


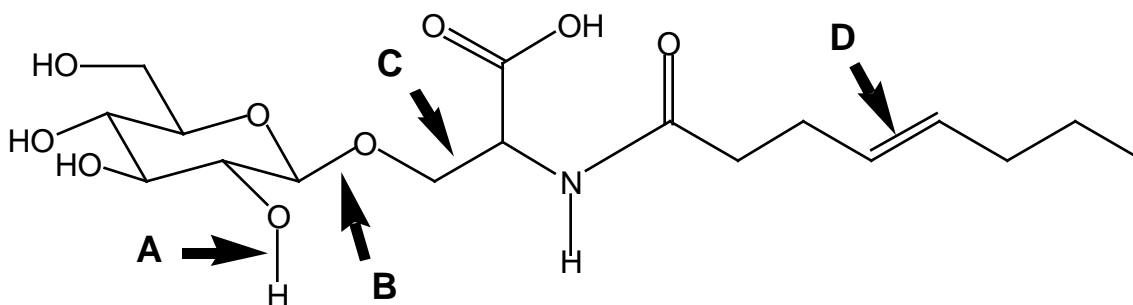
## Chemistry 341 - Problem Set I

Due September 24 at 5:00 PM

- 1) (5 pts.) This one is pretty dull. Mention two things that separate (in biochemical terms) a living organism from inanimate matter.
- 2) (5 pts.) Why is carbon the main atomic building block of all biomolecules? Justify your answer using atomic properties described in the periodic table, and please, try to limit your answer to 1/2 a page.
- 3) (5 pts.) Why do we need functional groups in biomolecules? Again, less than a book on this would be OK...
- 4) (10 pts.) For the following molecule, write the molecular formula (in the form " $C_xH_yN_zO_w$ "). Also, indicate to what family of monomers each of the boxed groups in the molecule belong.

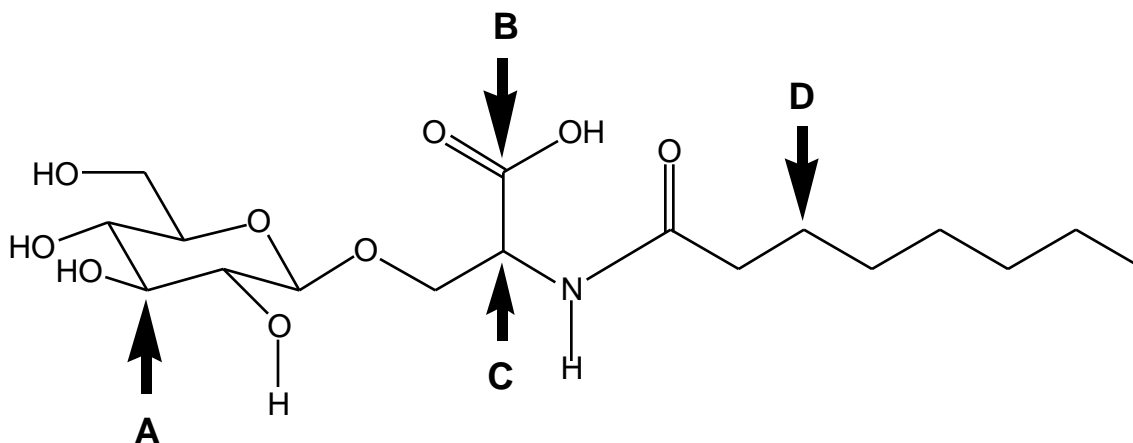


- 5) (10 pts.) For the very similar molecule shown below, what would be the polarity of the bonds indicated by the arrows? Order them by increasing polarity. Hint: electronegativities...



- 6) (10 pts.) Which of the bonds indicated above are rotatable, and which ones are not? Would this molecule be very flexible?

- 7) (10 pts.) For the molecule from question 5, which of the atoms indicated by the arrows are chiral, and which ones are not?



- 8) (15 pts.) Using the same molecule yet again, could we have pairs of diastereomers? If yes, how many (this last part for brownie-points)?