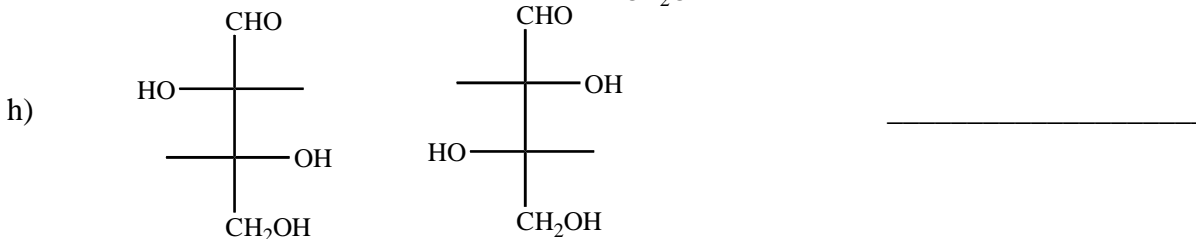
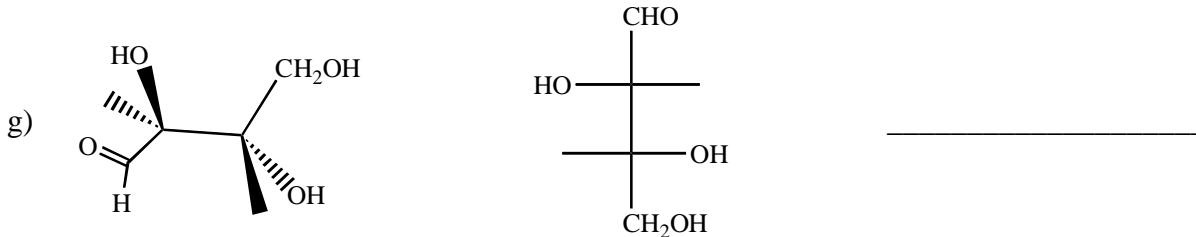
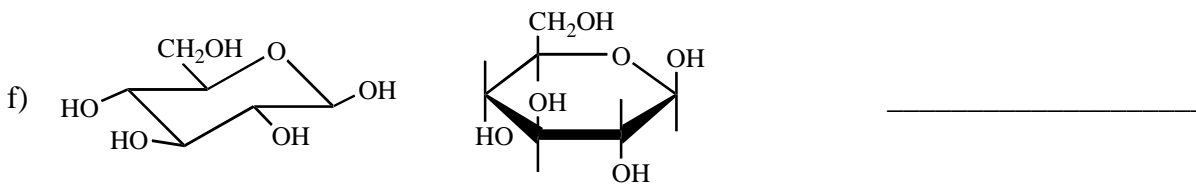
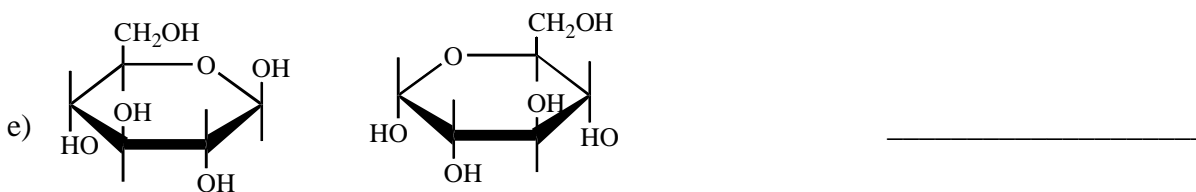
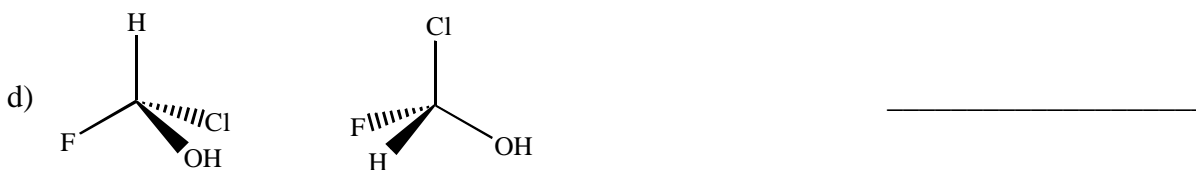
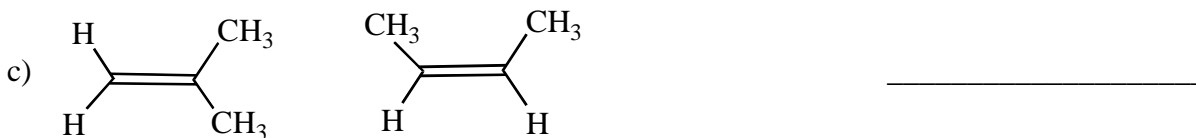
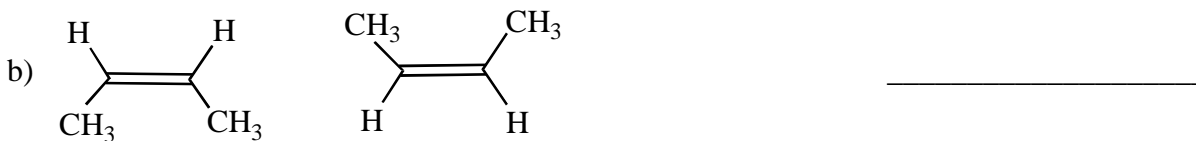
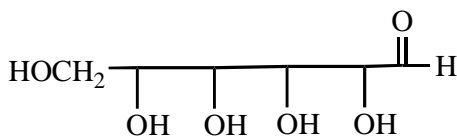


1. Classify each of the following pairs of structures as identical, constitutional isomers, enantiomers, diastereomers, or unrelated (3 points each)



2. Write the structures of the two simplest alcohols that are constitutional isomers. (6 points)

3. Consider the following sugar (open form): (9 points)



- Put an asterisk (\*) next to each stereocenter.
- How many stereoisomers are possible for this compound? \_\_\_\_\_
- How many pairs of enantiomers are possible for this compound? \_\_\_\_\_

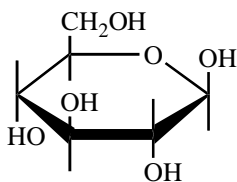
4. Write the structure of any: (8 points)

aldotetrose –

ketopentose –

5. If fewer than 0.05% of all galactose molecules are in their open-chain form at equilibrium in water, how can galactose give a strong, positive Tollens' test? (5 points)

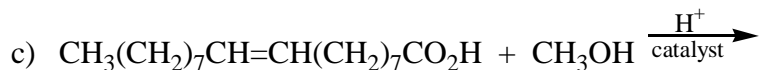
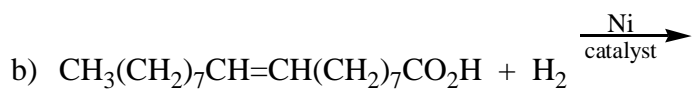
6. Draw the methyl glycoside of: (6 points)



Is it an alpha or beta glycoside?

7. How do amylose, amylopectin, and cellulose differ structurally? (9 points)

8. Draw structures of the products: (12 points)



9. Consider some generic fat molecule. Hydrolyzing it generates one \_\_\_\_\_ molecule and \_\_\_\_\_ molecules. The bonds that are hydrolyzed are \_\_\_\_\_ linkages. (12 points) Hint: The small blank is a number.

10. Phospholipids are a type of \_\_\_\_\_. How do they differ from the neutral fats described in question 9? (9 points) You can use a picture in your answer if you'd like.

11. Describe the basic structure and composition of the cell membrane. (5 points)