Problem Set Chapter 24

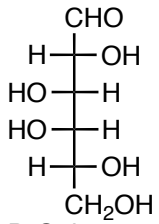
Organic Chemistry for Life Sciences: CHM 224

Name_____

DUE: Wednesday March 20th in class

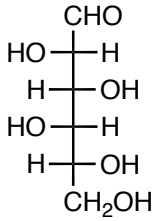
1. Draw Fischer projections for all of the non-naturally occuring aldopentoses

2. Draw the Fischer projection and provide the name for the *enantiomer* of D-Galactose (provided below):

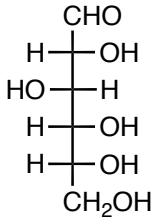


D-Galactose

3. Which of the following terms correctly describe the relationship between D-Idose and D-Glucose (may be more than one):



D-Idose



D-Glucose

A. enantiomers
B. epimers
C. anomers
D. diastereomers
E. stereoisomers

4. Draw the two pyranose rings that would be formed from D-iodose (structure in question 3):

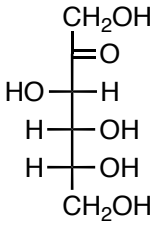
5. Label one of the two pyranose compounds drawn in question 4 as **A** and the other as **B**. Provide their ***complete*** names below:

A:

B:

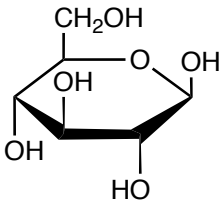
6. Jimmy says that 3 naturally-occurring epimers of D-fructose can be drawn (in addition to D-fructose itself). Is this true? Provide Fischer projections to support your answer.

Jimmy

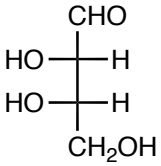


D-fructose

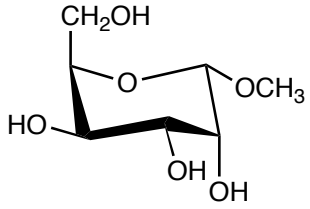
7. Draw the Fischer projection of the monosaccharide from which the following pyranose ring was formed:



8. What will be the two aldopentoses formed from a round of Kiliani-Fischer synthesis upon the following sugar:



9. The following sugar is drawn in *"non-standard"format* ***so look carefully***. Answer the questions based on its structure:



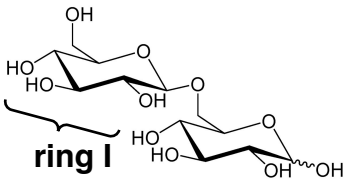
A. circle the acetal carbon

B. is this a reducing sugar?

C. is this an α or β anomer?

D. does this sugar undergo mutarotation in neutral solution?

10. The structure of Gentiobiose is provided below. Which of the following are true (may be more than one answer):



A. Gentiobiose is a complex carbohydrate
B. Gentiobiose will give a negative test with Tollen's reagent
C. Ring I of Gentibiose is a β anomer
D. Gentiobiose will undergo mutarotation in neutral solution
E. Hydrolysis of Gentiobiose will form two monosaccharides that are identical