

**CHEM 236 IN-CLASS PROJECT #3** (20 pts) NAMES \_\_\_\_\_

1 **Carefully and and with precision**, draw the open straight chain form (use the fisher projection) of glucose and the 2 cyclic forms, also called the pyranose forms,  $\alpha$  and  $\beta$ .

2. **Carefully and and with precision** draw the  $\alpha$  and  $\beta$  cyclic forms (also called the pyranose forms) of D-Galactose and D-Mannose. Out of these 4 forms, circle the form that you would consider the most stable. Also indicate which carbons in each form are the **Anomeric** carbons. You can find the structure of Galactose and Mannose on pg 982 (table 21.1)

3. Sucralose is a noncalorific sugar that is now commonly used in diet products. Sucralose has the structure of Sucrose but 3 of the OH have been replaced by Cl. The 3 OH positions that have been replaced are the C-4 position of the Glucose component and the C-1 and C-6 positions of the Fructose component of Sucrose.

Answer below on another piece of paper.

a. Draw the cyclic structure of Sucralose (See question 5 for the structure of sucrose).  
**Note:** When the OHs were replaced by the Cl's this was done via an **S<sub>N</sub>2** mechanistic route.

b. In a Seattle PI article from May 2006, there is an article on artificial sweeteners. The article states that the makers of Sucralose ('splenda') state that "It's made from sugar so it taste like sugar". The consumer advocate, James Turner, comments that "It (sucralose) is no resemblance at all to sugar—This is a chlorine-treated carbohydrate"

Which statement do you believe is more accurate and why? What are your opinions about 'artificial' sweeteners and foods?

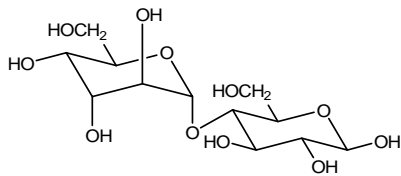
4. **Carefully and with precision** draw a disaccharide of Mannose and allose. Let the linkage be at C1 carbon of Mannose and the C4 carbon of allose. Draw both an  $\alpha$  and  $\beta$  glycosidic linkages.

5. a. for the structures below, circle all the 1,4 glycosidic linkages.

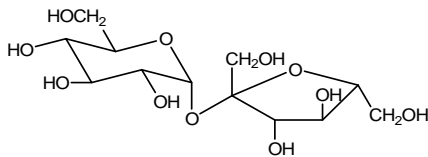
--b. Which di and tri saccharides below would you consider digestible by humans—in other words which could be enzymatically hydrolyzed to a mono saccharide.

--c. For the altose and glucose disaccharide below show the aldehyde form that it is in equilibrium with.

--d. For the last 2 structures, label the mono saccharide units that it is made up of (as was done for the first two).



altose and glucose



Sucrose; glucose and fructose

