CHM1033 Review Exercises Test 3 Mod 11 2 EC Points Name_____

1. Identify each of the following as: monosaccharide (M), disaccharide (D), or polysaccharide (D):

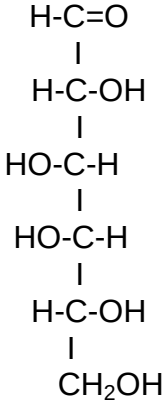
a. glucose____ b. fructose ____ c. glycogen ____ d. maltose ___ e. galactose ___
f. amylopectin ___ g. cellulose ___ h. lactose ___ i. sucrose ____ j. amylose ____

2. For each of the sugars in question 1a, indicate, for the monosaccharides only, whether they are aldoses (A) ketoses (K). For the others please indicate n/a (not applicable).
a. _____b. _____c. _____d. _____e. _____f. _____g. _____h. _____i._____ j. _____

3. For each of the sugars in question 1a, indicate, for the disaccharides and the polysaccharides only, what are the individual monosaccharides of which they are composed:
a. _____ b. _____ c. _____
d. _____ e. _____ f. _____
g. _____ h. _____ i. _____

4. For each of the sugars in questions 1a, indicate, for the polysaccharides only, what kind of bond, α or β, and what carbons numbers are linked for each. Indicate the name of the polysaccharide and the linkage for each:

5. Which carbon numbers for the following structure are chiral?_____



6. Is the above monosaccharide a D or and L sugar? _____
7. What category of monosaccharide is this? _____(e.g. aldotetrose)
8. A monosaccharide with four carbons and a ketone group is classified as a(n)_____. One with five carbons and an aldehyde group is classified as a(n)_____.
9. Refer back to question 1. Indicate which of the sugars give a positive Benedict's test (+) and which ones give a negative Benedict's test (-):

a.____b. ____c. ____d. ____e. ____f. ____g. ____h. ____i. ____f. ____

10. Refer back to question 1. Indicate which of the sugars give a positive iodine test (+) and which ones give a negative iodine test (-):

a.____b. ____c. ____d. ____e. ____f. ____g. ____h. ____i. ____f. ____

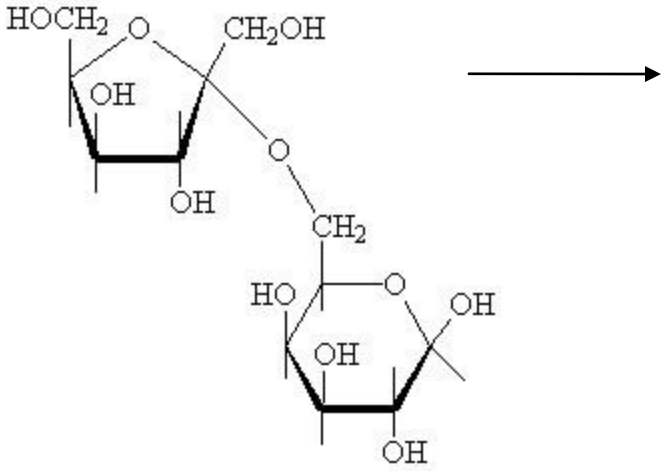
11. The linkage present in disaccharides and polysaccharides that join the individual monosaccharides together is called _____. This type of bond is similar to which of the following bonds? Circle the correct answer. Alcohol, ester, ether, aldehyde
12. In order to separate a disaccharide or a polysaccharide into individual monosaccharide units the reaction needed is called _____.

13. Complete the following reactions:

a. $CH_3CH_2CH_2OH + CH_3C(=O)H \longrightarrow$

b.

H^+, H_2O (acid hydrolysis)



14. Refer to structure 13b:
    a. What linkage exists between the monosaccharides?_____ (alpha (α) or beta (β))
    b. What category of monosaccharide is represented by the monosaccharide on the upper left side? _____(e.g. aldotetrose)
    c. What category of monosaccharide is represented by the monosaccharide on the lower right side?_____(e.g. aldotetrose)

15. Refer back to the sugars you identified in 9 as giving a negative Benedict's test. What is formed when this sugars undergo acid hydrolysis? Please indicate it for each one you identified as giving a negative Benedict's test

16. After hydrolysis, will the sugars in 15 give a positive or a negative Benedict's test?

17. Sugars that give a positive Benedict's test are _____ sugars.
18. When the Haworth projection is shown for an aldohexose, the ring is closed between carbon number ____ and the oxygen on carbon number ____.
19. When the Haworth projection is shown for a ketohexose, the ring is closed between carbon number ____ and the oxygen on carbon number ____.