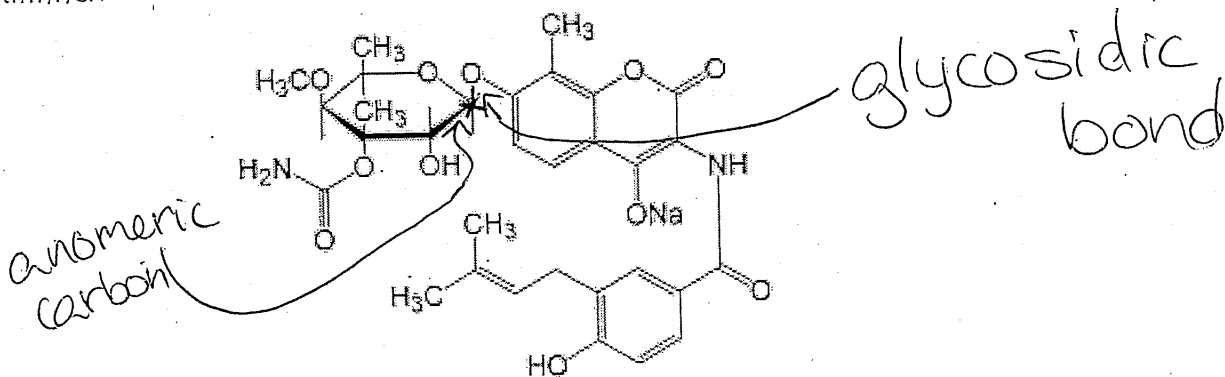


Carbohydrates Part 1

Exercises

1. Find the anomeric carbon and draw an arrow to the glycosidic bond in coumarin, a blood thinner.



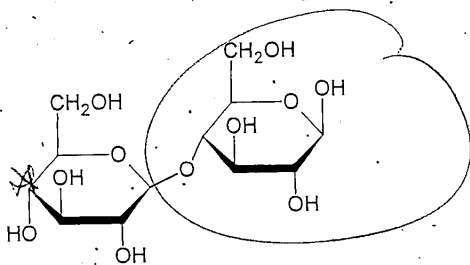
2. True or False? Explain your reasoning.

a) T

When β -D-galactose is dissolved in water, α -D-galactose, and the open chain form of galactose soon appear. *mutarotation*

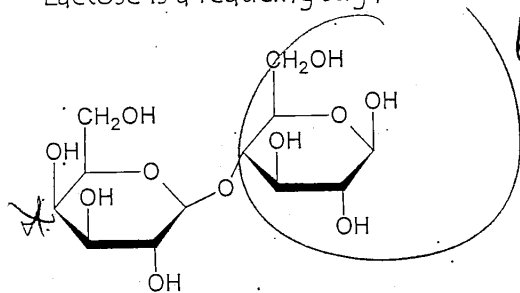
b) T

Cellulose is a reducing sugar.



c) T

Lactose is a reducing sugar.



both rings can open

d) T

Lactose and cellobiose are stereoisomers. *see * carbon*

e) F

Lactose and cellobiose are enantiomers. *not super-impos mirror images*

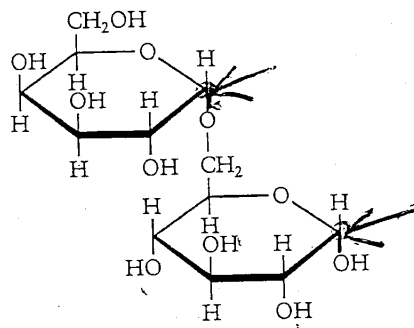
f) T

Lactose and cellobiose are diastereomers. *only 1 chiral C different*

g) F

Lactose and cellobiose are constitutional isomers. *same connections*

3. Melibiose, shown below, is a found in cacao beans.



a) Is melibiose a mono-, di-, tri-, or polysaccharide? Explain your reasoning.

disaccharide b/c 2 simple sugars

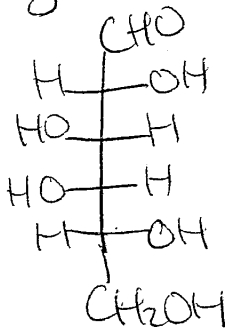
b) Label the anomeric carbon(s) in the structure above by pointing arrow(s) at them.

c) Classify the glycosidic bond(s) (α or β - #, #).

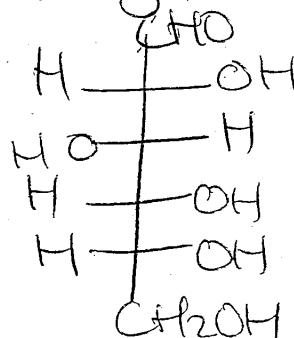
α -1,6

d) Draw the Fischer projections and name the hydrolysis products of melibiose.

D-galactose



D-glucose



e) Is melibiose a reducing sugar?

yes

4. Compare and contrast the chemical structure and digestion of starch and cellulose.

starch: α -glycosidic linkages
can be digested

cellulose: β -glycosidic linkages
can NOT be digested