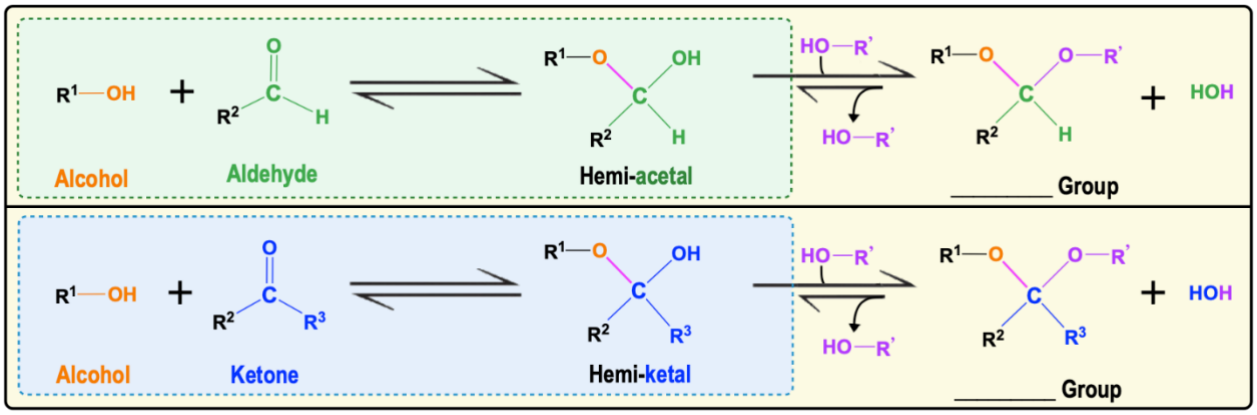
CONCEPT: REDUCING SUGARS

●Hemiacetals & hemiketals are susceptible to reacting with alcohols to form more *stable* _____ & _____ groups.



Reducing Sugars vs. Non-Reducing Sugars

●Note: Aldoses & ketoses can *reversibly* rearrange into each other via the **Enediol Rearrangement** mechanism.

●*Reducing Sugars*: *any* sugar capable of being *oxidized* (by acting as a _____ *agent*).

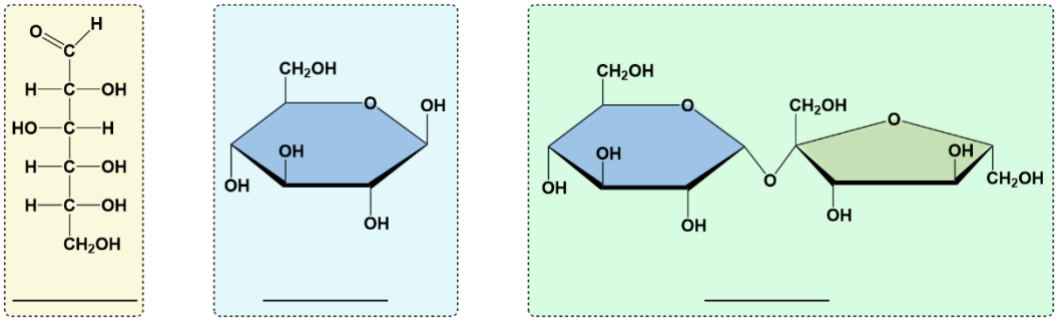
□ Must either *have* or can rearrange to generate a *free* _____ group.

1) Includes *ALL* simple, _____ sugars.

2) Includes cyclic sugars with a _____ hemiacetal or hemiketal (which are in ⇌ with their linear forms).

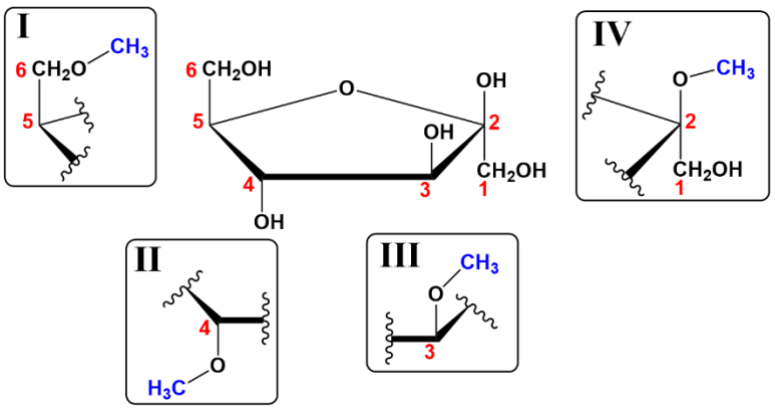
●_____-*Reducing Sugars*: _____ of a reducing sugar; includes _____ & _____.

EXAMPLE: Appropriately label each of the following carbohydrates as reducing sugars or non-reducing sugars.



PRACTICE: Which chemical modification (I-IV) converts D-fructofuranose from a reducing to a non-reducing carbohydrate?

a) I.
b) II.
c) III.
d) IV.
e) None of them.

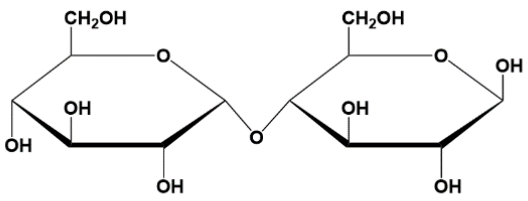


CONCEPT: REDUCING SUGARS

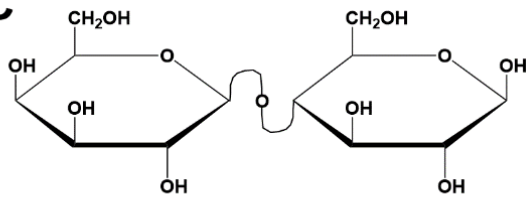
PRACTICE: Which of the following disaccharides are reducing sugars?

a) Sugars A & B. b) Sugars B & C. c) Sugars C & D. d) Sugars A & C. e) >2 sugars.

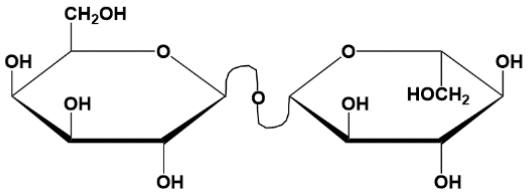
A



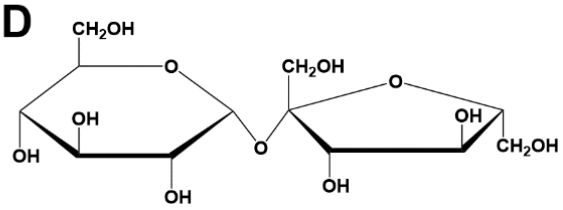
C



B

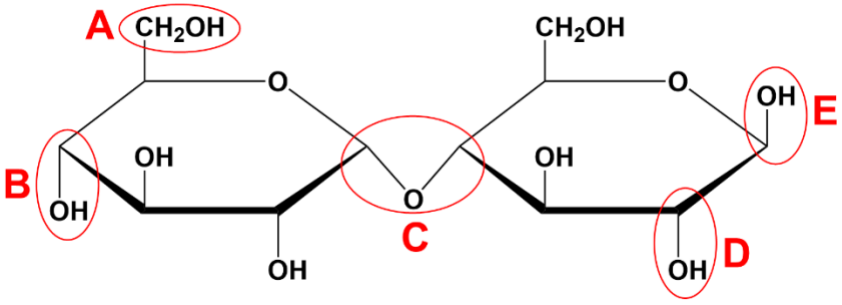


D



PRACTICE: Which chemical group below indicates that the sugar is a reducing disaccharide? Is "**C**" an acetal or ketal?

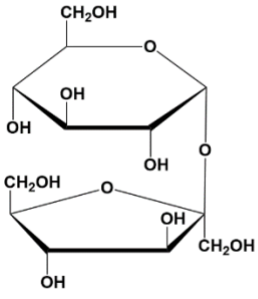
a) A. b) B. c) C. d) D. e) E.



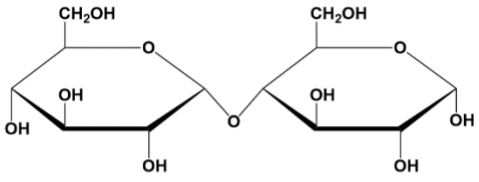
PRACTICE: Which of the molecules below have a reducing end?

a) Molecule 1.
b) Molecule 2.
c) Molecule 3.
d) Both Molecules 2 and 3.
e) Molecules 1, 2, and 3.

Molecule 1



Molecule 2



Molecule 3