

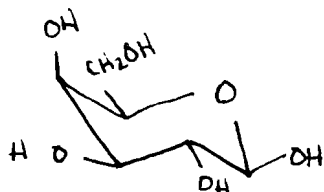
Am 21
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Chem 243 exam #3, June 15, 2009

Name Kobe Bryant

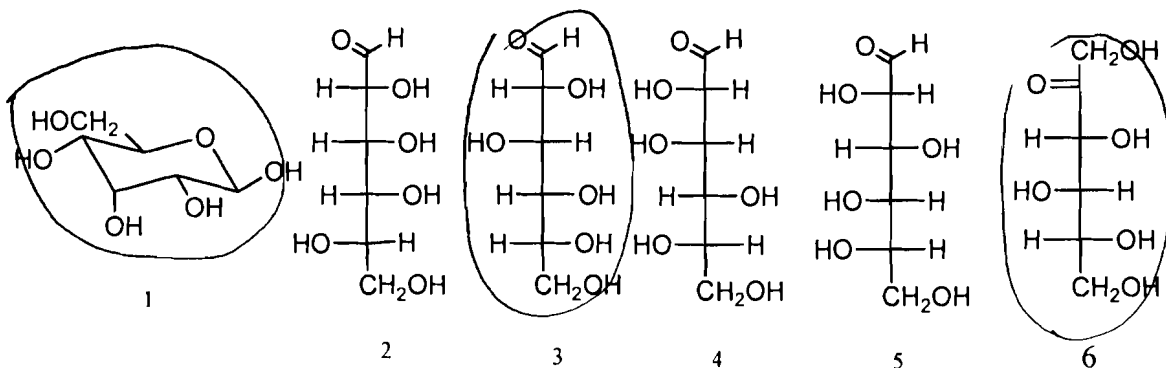
1. (5 pts) Draw the cyclic form of β -D-Galactose.
 --Draw the chair conformation that is most stable



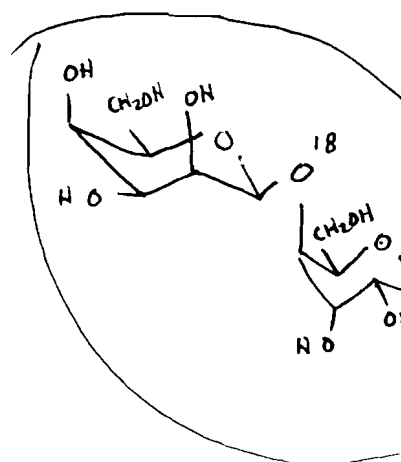
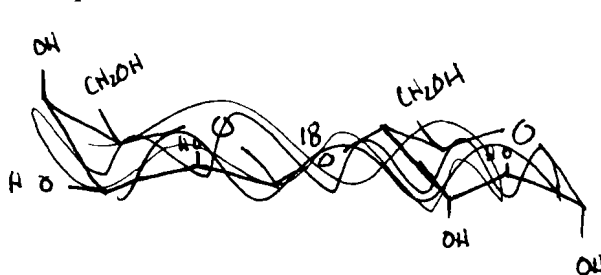
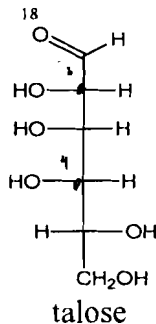
2. a. (4 pts) Circle the sugar(s) depicted below that are considered 'D' sugars. (The open chain sugars are depicted as Fisher projections).

b. (3 pts) Would you find the circled sugars naturally occurring on this planet? yes

c. (2 pts) Which pair(s) of sugars below are enantiomers? 3 and 5 are enantiomers



3. (10 pts) Draw the structure of a **disaccharide of D-talose and D-gulose** - C_2-C_3 epimer
 --For this structure the talose C1 carbon is connected to the C4 of gulose
 --The 1,4 Glycoside linkage is β .
 --The anomeric carbon of gulose is in the α position.
 --Make sure you incorporate the O^{18} atom in talose into the disaccharide



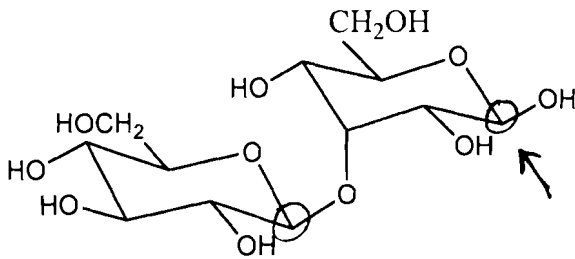
4. a) (4 pts) For the disaccharide below what are the 2 mono saccharide units it contains?

→ glucose + Allose

b) (4 pts) **Circle** the anomeric carbon(s) that are present.

c) (3 pts) Draw an arrow → to the carbon(s) that are considered 'hemiacetals' and that are in equilibrium with the open chain aldehyde form (you do not have to draw the open chain)

c (3 pts) Describe glycosidic link -choose one from A-F: A) α -1,4 B) β -1,4 C) α -1,3
D) β -1,3 E) α -1,5 F) β -1,5 ?



5. (12 pts) Draw the tetrapeptide **Tyr-Phe-Gly-Cys** See the additional handout for the structures of the amino acids.

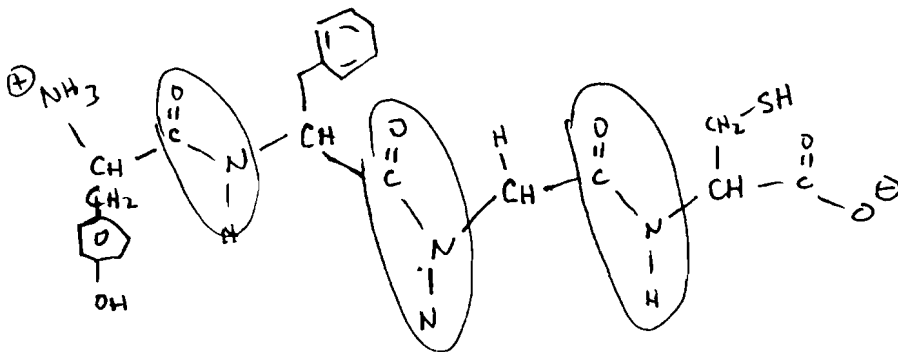
Be sure to:

--**Circle** the 'peptides bonds' that are present.

--Clearly draw peptides bonds in the 'trans' configuration

--Draw the zwitterion form

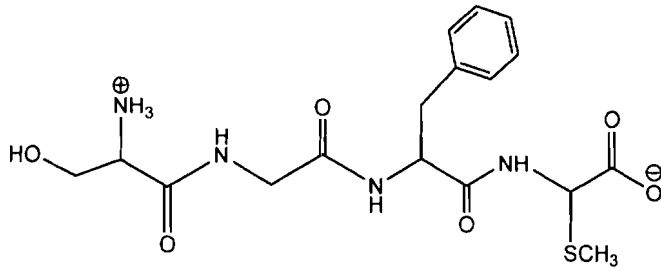
--You **do not** have to show stereochemistry of any chiral carbons.



b. (2 pts) Could this peptide form any 'disulfide bonds'? **yes** (or no)

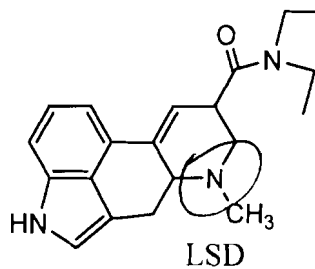
c (2 pts) How many 'Chiral carbons' are present in this tetra peptide? **3** Gly is not chiral

6. (5 pts) a. Name the peptide below by the 3 lettered abbreviated amino acid notation (as in the previous question).



Ser-Gly-Phe-Met

7. (4 pts) Below is the molecule LSD a powerful psychedelic drug. **Circle the Nitrogen** atom in the molecule this is mostly like responsible for its strong physiological effects.

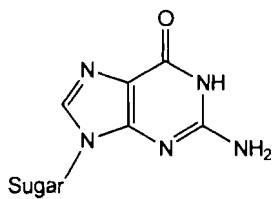


8. Shown below are the 4 bases that are present in the DNA/RNA molecules.

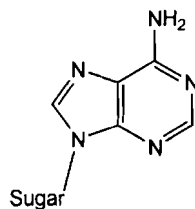
a. (4 pts) Which bases are complementary base pairs. **A/T**

~~G/C~~ **G/C**

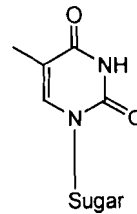
b. (5 pts) Draw the hydrogen bonding interactions between **one of the base pairs** listed below.



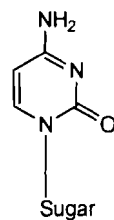
Guanine (G)



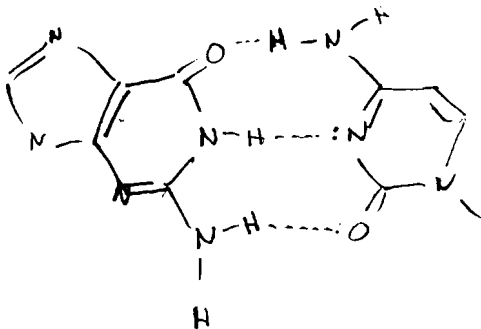
Adenine (A)



Thymine (T)

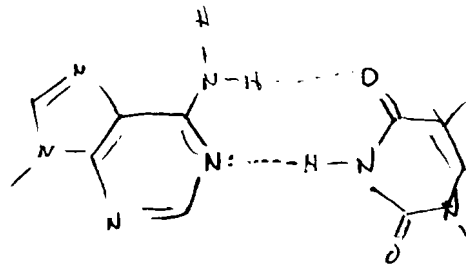


Cytosine (C)



G

C

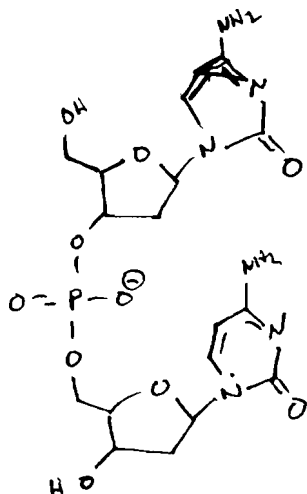


A

T

T

9. (6 pts) Draw a segment of DNA (deoxyribonucleic acid) that is 2 ribose sugar units long and a cytosine base is attached to each ribose sugar unit. Be sure to include the phosphate link between the 2 sugar units.



10. (4 pts) If you were to visit the alternate 'enantiomeric earth' on the other side of sun (where everything is the mirror image of everything on this earth) what could you properly digest/metabolized if you went out to dinner on alternate earth (circle all that your body could process normally).

- a) Water, b) Proteins, c) Starch, d) Fats, e) Oils, f) Beer (ethanol) g) After dinner mint
- All are achiral molecules*

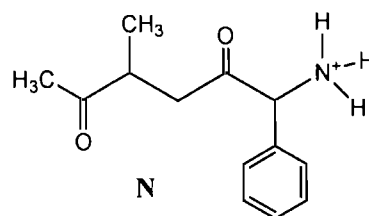
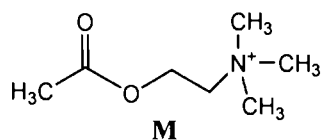
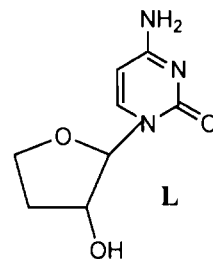
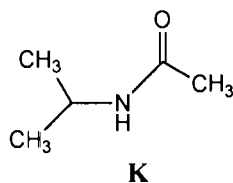
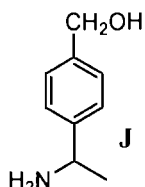
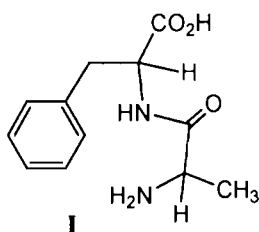
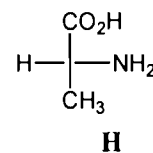
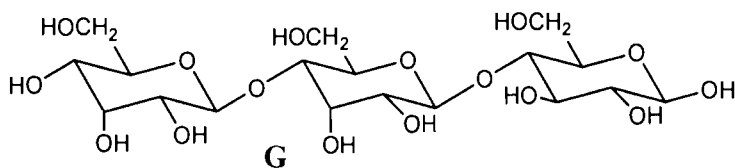
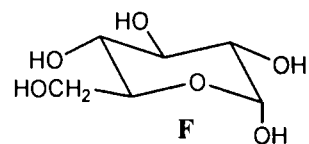
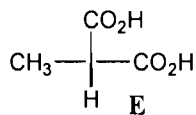
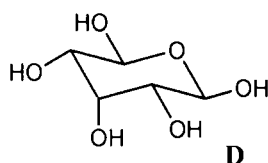
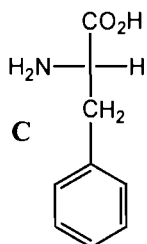
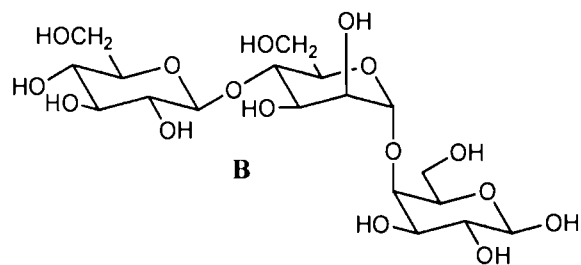
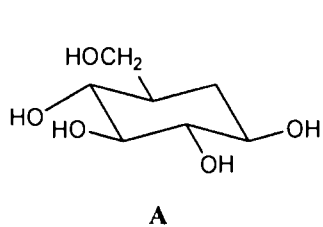
11. (3 pts ea) Use the list of compounds shown on the next page to answer question 8 a-f. For each answer write in the number corresponding to the correct structure. There can be more than one answer for each question.

- a. Which compound(s) are a **carbohydrate (sugar)**? B, D, F, G (A) maybe
- b. Which compound(s) contain a **peptide bond(s)**? I
- c. Which compound(s) contain an **Anomeric carbon**? B, D, F, G (L) ← ok
- d. Which compound(s) would you consider to be a **trisaccharide**? B, G
- e. Which compound(s) contain a **β Glycosidic linkage**? B, G
- f. Which compound(s) would you consider to be a **α-amino acid**? B, C, H

Extra credit (2 pts) What was your favorite part/molecule/moment of Organic chemistry?

2. (1 pt) What is your instructor's brother Dave nickname? The 'Dart'

These compounds are to be used for question #11

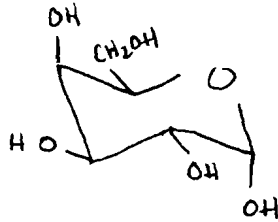


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Chem 243 exam #3b, June 15, 2009

Name George Karl

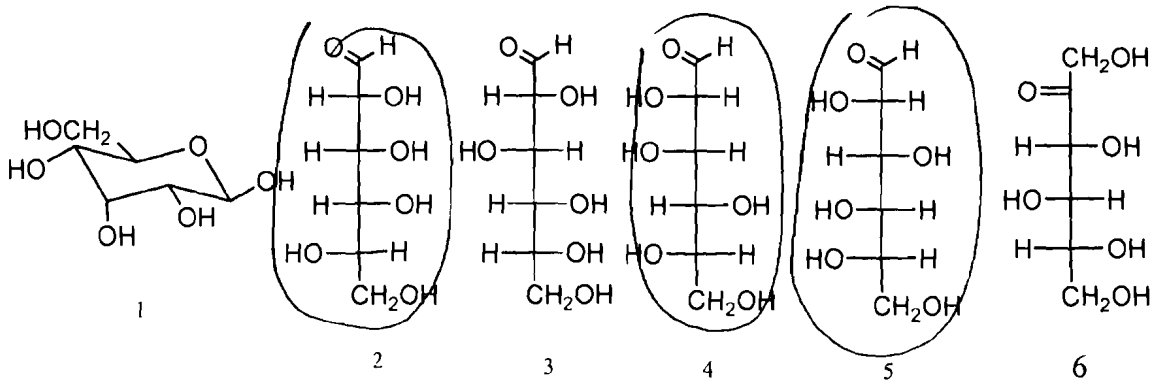
1. (5 pts) Draw the cyclic form of α -D-Galactose.
--Draw the chair conformation that is most stable



2. a. (4 pts) Circle the sugar(s) depicted below that are considered 'L' sugars. (The open chain sugars are depicted as Fischer projections).

b. (3 pts) Would you find the circled sugars **naturally occurring** on this planet? NO

c. (2 pts) Which pair(s) of sugars below are enantiomers? 3 and 5 are enantiomers



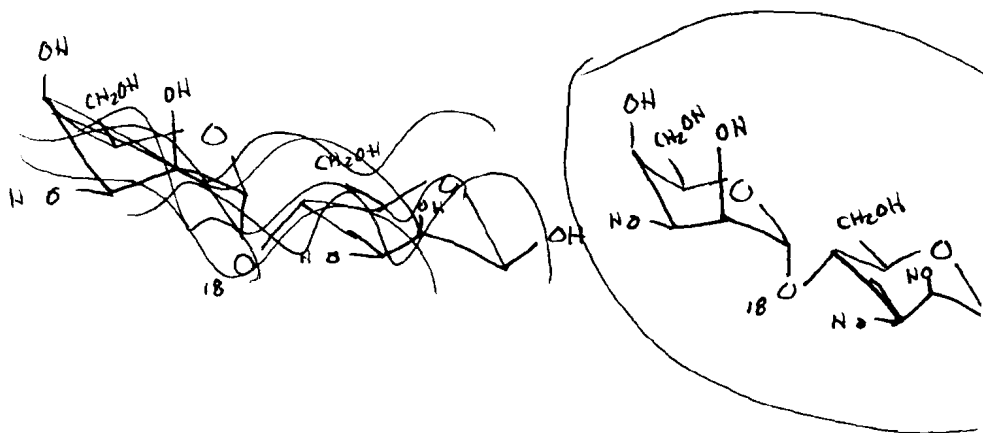
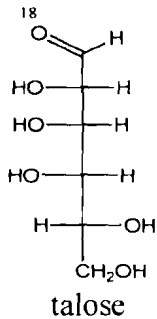
3. (10 pts) Draw the structure of a **disaccharide of D-talose and D-mannose**

--For this structure the talose C1 carbon is connected to the C4 of ~~glucose~~ mannose

--The 1,4 Glycoside linkage is α .

--The anomeric carbon of ~~glucose~~ mannose is in the β position.

--Make sure you incorporate the O^{18} atom in talose into the disaccharide



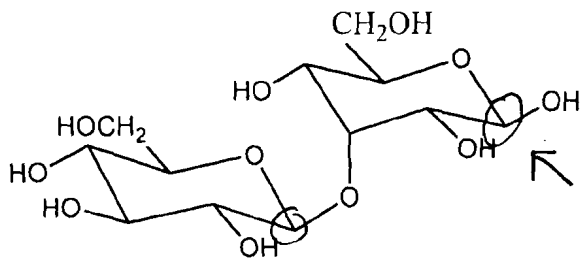
4. a) (4 pts) For the disaccharide below what are the 2 mono saccharide units it contains?

Glucose / Allose

b) (4 pts) **Circle** the anomeric carbon(s) that are present.

c) (3 pts) Draw an arrow \rightarrow to the carbon(s) that are considered 'hemiacetals' and that are in equilibrium with the open chain aldehyde form (you do not have to draw the open chain)

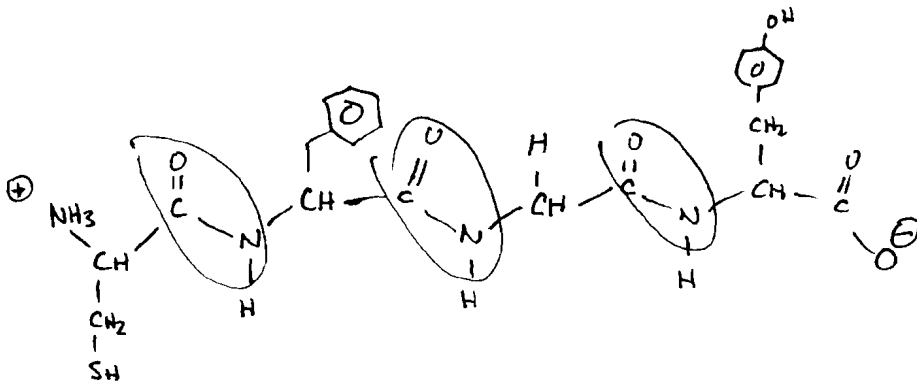
c (3 pts) Describe glycosidic link -choose one from A-F: A) α -1,3 B) β -1,3 C) α -1,4 D) β -1,4 E) α -1,5 F) β -1,5 ?



5. (12 pts) Draw the tetrapeptide **Cys-Phe-Gly-Tyr** See the additional handout for the structures of the amino acids.

Be sure to:

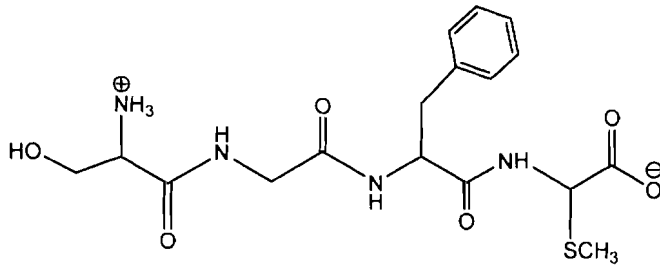
- Circle** the 'peptides bonds' that are present.
- Clearly draw peptides bonds in the 'trans' configuration
- Draw the zwitterion form
- You **do not** have to show stereochemistry of any chiral carbons.



b. (2 pts) Could this peptide form any 'disulfide bonds'? (yes or no)

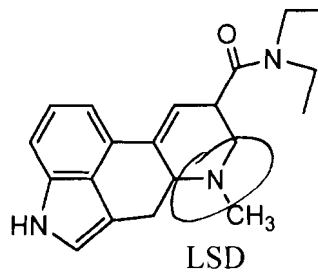
c (2 pts) How many 'Chiral carbons' are present in this tetra peptide? 3 Gly is not chiral

6. (5 pts) a. Name the peptide below by the 3 lettered abbreviated amino acid notation (as in the previous question).



Ser-Gly-Phe-met

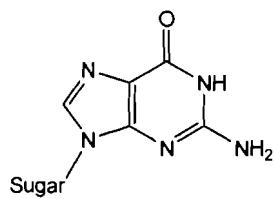
7. (4 pts) Below is the molecule LSD a powerful psychedelic drug. **Circle the Nitrogen** atom in the molecule this is mostly like responsible for its strong physiological effects.



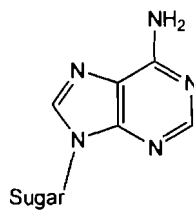
8. Shown below are the 4 bases that are present in the DNA/RNA molecules.

a. (4 pts) Which bases are complementary base pairs. GC / AT

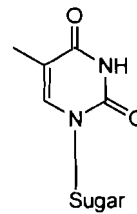
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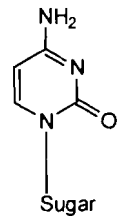
Guanine (G)



Adenine (A)



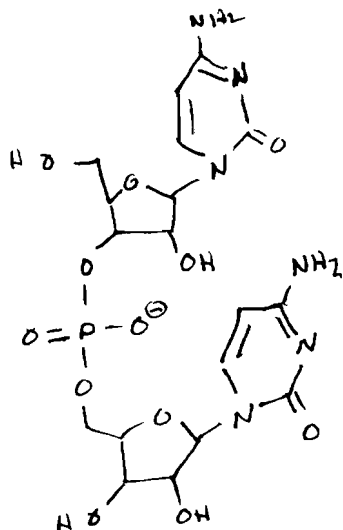
Thymine (T)



Cytosine (C)

See other key

9. (6 pts) Draw a segment of RNA (ribonucleic acid) that is 2 ribose sugar units long and a cytosine base is attached to each ribose sugar unit. Be sure to include the phosphate link between the 2 sugar units.



10. (4 pts) If you were to visit the alternate 'enantiomeric earth' on the other side of sun (where everything is the mirror image of everything on this earth) what could you properly digest/metabolized if you went out to dinner on alternate earth (circle all that your body could process normally).

a) Water, b) Proteins, c) Starch, d) Fats, e) Oils, f) Beer (ethanol) g) After dinner mint

11. (3 pts ea) Use the list of compounds shown on the next page to answer question 8 a-f. For each answer write in the number corresponding to the correct structure. There can be more than one answer for each question.

- a. Which compound(s) contain an **Anomeric carbon**? B, D, F, G (L)
- b. Which compound(s) contain a **β Glycosidic linkage**? B, G
- c. Which compound(s) are a **carbohydrate (sugar)**? B, D, F, G
- d. Which compound(s) contain a **peptide bond(s)**? I
- e. Which compound(s) would you consider to be a **trisaccharide**? B, G
- f. Which compound(s) would you consider to be a **α -amino acid**? C, H

Extra credit (2 pts) What was your favorite part/molecule/moment of Organic chemistry?

2. (1 pt) What is your instructor's brother Dave nickname? The 'Dart'