

KEEP THIS CLOSED ON YOUR DESK UNTIL THE START OF THE TEST
NO NOTES, BOOKS OR MODELS PERMITTED

BCH 2140

Midterm

THIS IS VERSION A , ANSWERS AND SOME COMMENTS ARE ON THE END.

Professor: Mezl^a

Friday February 20 , 2004

Materials needed: One computer answer sheet
This exam

Calculators are permitted.

INSTRUCTIONS

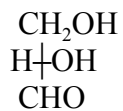
Pick the **BEST** answer for each multiple choice question

AT THE END - Verify that your name and student number are on the answer sheet.

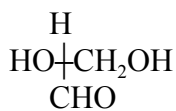
Hand in just the computer answer sheet.

Keep the exam: a corrected exam will be posted at the web site

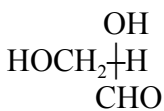
1. D-glyceraldehyde is :



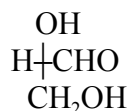
(A)



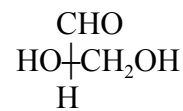
(B)



(C)

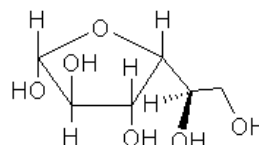


(D)



(E)

Use Structure X (shown on the right) to answer the following series of questions:



2. Structure X is:

- A) an aldose B) an alditol C) an aldurionate
D) a ketose E) a ketitol

3. X is a :

- A) L-lactam B) D-pyranose C) L-pyranose D) D-furanose E) L-furanose

4. There is a deoxy group on carbon:

- A) 1 B) 3 C) 4 D) 6 E) none of these carbons

5. X is :

- A) an α anomer B) a β anomer C) an α anomer at one end and a β at the other
D) a cis isomer E) a trans isomer

6. If you redrew this structure with the difference that you interchange the H and OH on carbon 5, you would have:

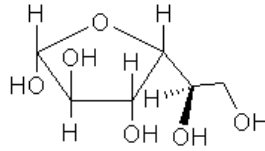
- A) the enantiomer of X B) the same structure C) the anomer of X
D) an impossible structure E) a sugar with a different name

7. If you redrew this structure and put the OH that is on the extreme right so that it faces up, you would have:

- A) the enantiomer of X B) the same structure C) the anomer of X
D) an impossible structure E) a sugar with a different name

8. X is a :

- A) 1,5 hemiacetal B) 1,4 hemiacetal
C) 3,6 hemiacetal D) acetal E) cyclic ester



9. X has the configurations of :

- A) Fructose B) Glucose C) Mannose D) Galactose E) None of these four

10. X has a primary alcohol at position

- A) 1,2,3,5,6 B) 1,2,4,5,6 C) 1 D) 6 E) 2,4,5

11. In solution you swim up to the OH of carbon 2, grab the O and rotate it 180° around the carbon to which it is attached (in other words you push it down in the direction of the C-H bond). This action will :

- A) give an epimer of X
B) give an anomer of X
C) cause this carbon to rotate 180° around the C-C bond that attaches it to the next carbon
D) cause the molecule to rotate by 180°
E) can only be done if the ring is opened first

*****END OF QUESTIONS ON STRUCTURE*****

12. The amount of glucose in 1 ml of your blood is approximately:

- A) 5 mMol B) 0.5 mMol C) 5 μMol D) 0.5 μMol E) 50 nMol

13. Sucrose is :

- A) An epimer of glucose B) Glucose linked to galactose C) glucose linked to lactose
D) Glucose linked to fructose E) a polymer of glucose

14. Which of the following is the least soluble at pH7 ? :

- A) a pyrimidine B) a purine nucleotide C) glucuronic acid
D) sulfate E) phosphate

15. In a nucleotide, the group on the sugar that is linked to the base is :
- A) a primary alcohol group B) a ketone C) the anti carbon
D) the reference carbon E) an anomeric carbon
16. Which of the following is a nucleoside ?
- A) Adenosine B) Cytosine C) Guanine D) Thymine E) Uracil
17. In the Watson-Crick double helix, the plane defined by the sugar
- A) is parallel to the 5' to 3' direction
B) is parallel to the axis of the helix
C) is perpendicular to the axis of the helix
D) divides the major groove into two halves
E) divides the minor groove into two halves
18. Nucleic acids are called acids because:
- A) some of the bases bear positive charges when they are not in the double helix
B) they precipitate when acid is added.
C) they contain charged nitrogen groups.
D) they contain charged phosphate groups.
E) they contain charged carboxyl groups.
19. You add acid to a sample that contains DNA and RNA. After a short incubation:
- A) The sample contains only DNA
B) The sample contains only RNA
C) The DNA precipitates and the RNA stays in solution
D) The RNA precipitates and the DNA stays in solution
E) The DNA and the RNA will precipitate
20. This question identifies the version of the test that you are writing.
- Put a **A** as the answer to this question
21. A nucleotide in an RNA has a free alcohol group
- A) at the 5' position B) at the 2' position C) at the 3' position
D) at the 2' and 3' position E) it does not have a free alcohol group

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X---VERSION-A---
...B.....

It is β -D-glucofuranose

hemiacetal, same as glucopyranose

A robot does a physical action
Huge differences in answers yet 75 got it
wrong-> this is why you want to always do
YOUR estimates...

Recall professor spinning in class
Just like amino "acids"
Both are coated with negative charges