QUESTIONS 1-19 ANSWERS ARE ON END

name (family name IN CAPITALS, first name) : ..... , ...

student number : _____

BCH 2333A and B

MID TERM EXAM

March 3, 2012 1- 4 pm

Professors: Figeys, Mezl

Length : 3 hours (You are given 3 hrs to do this 2 hour exam)

Material needed: A computer answer sheet
This exam

CLOSED BOOK EXAM

Two carbons and faculty approved calculators are permitted

INSTRUCTIONS

Part I (60 % of grade)

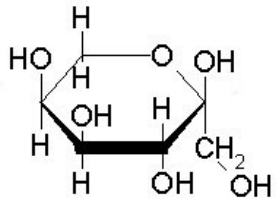
Choose the **BEST** answer for each of the **40 multiple choice questions** and fill it in on the computer answer sheet

Part II (40 % of the grade)

Answer THREE of these **four** questions directly on the exam

AT THE END: - Check that your name and student number are on the computer sheet **AND ON THE EXAM.**

Call this sugar Testose
and use it for the following questions.



1. To make the five atom sugar ring of testose (the type of ring found in ribose), carbon ..... would be linked to carbon ....
   A) 1, 4 B) 1, 5 C) 3, 6 D) 5, 1 E) 5, 2

2. Testose contains
   A) an acetal B) a hemiketal
   C) a hidden aldehyde D) a blocked anomeric group
   E) a carbon oxidized to the level of carboxyl

3. Testose has a prochiral carbon at position:
   A) 1 B) 1 and 6 C) 2, 3, 4 D) 5 E) 6

4. Testose is:
   A) a lactone
   B) could also be called testonate
   C) a sugar that will undergo mutarotation
   D) a sugar that will not have optical activity
   E) a non reducing sugar in the industrial Fehling test

5. Testose is a:
   A) D-furanose B) L-furanose C) D-pyranose
   D) L-pyranose E) D-pentanose

6. In terms of anomers, Testose is a:
   A) α-pentose B) β-pentose
   C) α-hexose D) β-hexose
   E) sugar that does not have an anomeric group

7. Testose is :
   A) Fructose B) Glucose
   C) Mannose D) Galactose
   E) a sugar that you do not have to know by heart

8. The most oxidized carbon/s on testose:
   A) 1 B) 2 C) 2, 3, 4 D) 5 E) 6

9. A 50 mM acetate buffer (K_a = 1.6 10^{-5}, pK_a = 4.8) has a pH of 4.8. To 0.1 L of this buffer you add 2 millimoles of base. The new pH will be about :

A) 4.8 B) 5.0 C) 5.3 D) 5.7 E) 12

10. D-glyceraldehyde is :

(A)	(B)	(C)	(D)	(E)
CH_2OH H┼OH CHO	H HO┼CH_2OH CHO	OH $HOCH_2$┼H CHO	OH H┼CHO CH_2OH	CHO HO┼CH_2OH H

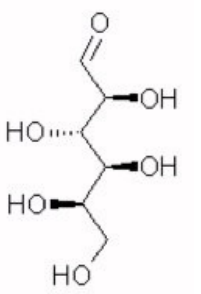
11. Approximate size of a mitochondrion :

A) 100 nm B) 2 μm C) 20 μm D) 200 μm E) 1,000 μm

12. The length of a C-H bond is about :

A) 0.015 nm B) 0.11 nm C) 0.17 nm D) 0.28 nm E) 1.5 nm

13. This structure is:



A) D-Glucose
B) D-Mannose
C) L-Mannose
D) an L-sugar that you do not have to know by heart
E) a D-sugar that you do not have to know by heart

14. A solution has a pH of 6.7 . The concentration of H^+ is about ..... M:

A) 4 10^{-6} B) 8 10^{-7} C) 1 10^{-7} D) 2 10^{-7} E) 5 10^{-7}

15. The concentration of H^+ in blood is about:

A) 0.4 mM B) 4 μM C) 40 nM
D) 0.4 nM E) 4 pM

16. You scuba dive to the Andrea Dorea (a famous wreck that is 100 m down in the ocean) breathing air the whole time. When you are on the bottom, the **oxygen** in your body will be at a pressure of about ..... Atm.

A) 1.5 B) 2 C) 4 D) 8 E) 10

17. Coulomb's law gives :

A) the repulsion between two molecules as a function of their charge and the dielectric constant
B) the repulsion between two molecules as a function of their mass and their dipole moment
C) the attraction between two molecules as a function of their charge and the dielectric constant
D) the attraction between two molecules as a function of their mass and the dielectric constant
E) the attraction between two molecules as a function of their mass and their dipole moment

18. At pH 3, the ratio of OH^- to H^+ is about: :

A) 1 / 50,000 B) 1 / 100,000 C) 1 / 1,000,000 D) 1 / 10,000,000 E) 1 / 100,000,000

19. The dielectric constant is ..... to the dipole moment.

A) related B) inversely related
C) proportional D) inversely proportional
E) not related