

version a CORRECT ANSWERS ARE ON THE END
KEEP THIS CLOSED ON YOUR DESK UNTIL THE START OF THE TEST

NO NOTES or BOOKS PERMITTED

BCH 2333B

Midterm 1

Professor: Bennett, Mezl^A

Wednesday Jan 28, 2009

15 QUESTIONS - 30 MINUTES

Materials needed: One computer answer sheet
This exam

Faculty of Science approved 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.

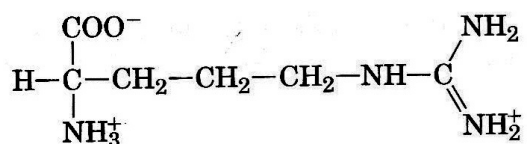
1. Choose the correct answer :

- A) if 1,2, and 3 are correct
- B) if 1 and 3 are correct
- C) if 2 and 4 is correct
- D) if 4 is correct
- E) if 1,2,3, and 4 are correct

Which of the following are non-essential amino acids ?

- 1) Serine
- 2) Glycine
- 3) Proline
- 4) Tyrosine

2. This amino acid is:



- A) S
- B) K
- C) L
- D) V
- E) None of the above

3. Which feature below is the most important indicator of the existence of life on Mars through the Urey Mars Organic and Oxidant Detector (UMOOD) analysis of amino acid?

- A) chirality of amino acids detected
- B) the presence of amino acids in soil samples
- C) the proportion of essential and non-essential amino acids detected
- D) the number of amino acids detected
- E) a 50% ratio of L-amino acids to D-amino acids

4. Identify the only amino acid having a ionizing R group with a pK_a near 7. It is an important group in the active site of some enzymes

- A) tyrosine
- B) isoleucine
- C) histidine
- D) cysteine
- E) serine

5. Choose the correct answer :

- A) if 1,2, and 3 are correct
- B) if 1 and 3 are correct
- C) if 2 and 4 is correct
- D) if 4 is correct
- E) if 1,2,3, and 4 are correct

Which of the following statements are true

- 1) There is free rotation around the peptide bond due to the double bond nature of the resonance hybrid form and electron delocalization
- 2) Most peptide groups are found in trans configuration
- 3) Placement of a proline following a cis peptide bond destabilizes peptide conformation
- 4) Secondary conformation is, in part, specified by the ϕ and ψ torsion angles

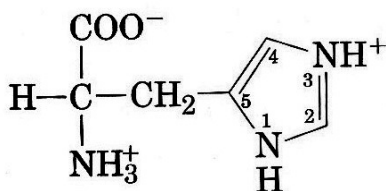
6. Choose the correct answer :

- A) if 1,2, and 3 are correct
- B) if 1 and 3 are correct
- C) if 2 and 4 is correct
- D) if 4 is correct
- E) if 1,2,3, and 4 are correct

Which of the following statements are true

- 1) Rotation around the central bond increases the energy of a molecule and it becomes less stable
- 2) Staggered configuration is less stable than eclipsed configuration
- 3) α -helical secondary structure is stabilized by hydrogen bonding of each carbonyl oxygen with the amide hydrogens of the 4th residue further toward the C-terminus (n+4)
- 4) β -helical secondary structure is stabilized by hydrogen bonding of each carbonyl oxygen with the amide hydrogens of the 3rd residue further toward the C-terminus (n+3)

7. The structure of histidine at physiological pH is below. The pK_1 is 1.8. The pK_r is 6.0. The pK_2 is 9.3. Calculate the pI (rounded to the nearest decimal point).

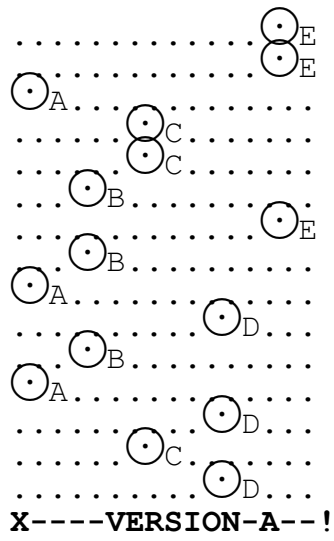


- A) pI= 8.6
- B) pI= 2.6
- C) pI= 10.7
- D) pI= 6.7
- E) None of the above

8. Approximate size of a prokaryotic cell :
- A) 100 nm B) 2 μm C) 25 μm D) 300 μm E) 4,000 μm
9. Which of the following is not a hydrogen bond?
- A) O-H \cdots H-C B) N-H \cdots N C) O-H \cdots N
D) P=O \cdots H-O E) O-H \cdots O=C
10. At this O₂ pressure humans can only function for a short period of time
- A) 150 mm Hg B) 500 mm Hg C) 750 mm Hg D) 1500 mm Hg E) 4000 mm Hg
11. The reaction, CO₂ + H₂O \rightarrow C₆H₁₂O₆ + O₂ is a/an
- A) oxidation B) reduction C) hydrolysis
D) bicarbonate buffer reaction E) rearrangement
12. 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
13. Which of the following is approximately equal to the osmotic pressure in your cells ?
- A) 30 mM KCl B) 60 mM KCl C) 100 mM KCl D) 150 mM KCl E) 300 mM KCl
14. A 10⁻⁴ M solution of a strong base will have a pH of about:
- A) 4 B) 7 C) 10 D) 12
E) This pH can not be estimated with the methods learned in class
15. For acetic acid, K_a = 1.75 $\cdot 10^{-5}$. Which of the following has a pH of 3.75?
- A) 11 mM acetic acid
B) 1 mM acetic acid and 10 mM sodium acetate
C) 5 mM acetic acid and 5 mM sodium acetate
D) 10 mM acetic acid and 1 mM sodium acetate
E) 11 mM sodium acetate
16. This question identifies the version of the test that you are writing.

Verify that it says **A** on your answer sheet as the answer to this question.
IF IT DOES NOT INFORM THE PROCTOR IMMEDIATELY!

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17



Exam:Date:File:
90121__ans_