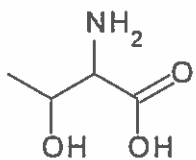


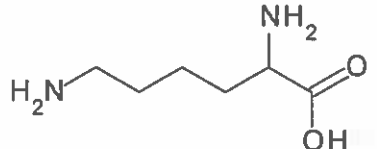
CHP 10

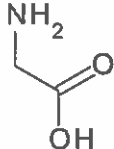
1. (10.1) How many amino acids are essential in humans?

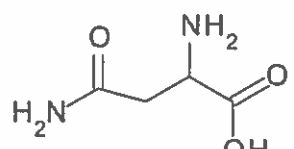
- A) 5 **(B) 10** C) 18 D) 20

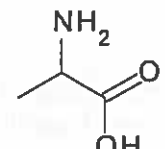
* (10.1) Use these answers for Questions 2-6. Some questions require more than one answer.

* 2.  **A, C**

3.  **C**

4.  **B**

* 5.  **C, D**

6.  **B**

This amino acid...
 A) has more than one chiral carbon atom.
 B) is hydrophobic.
 C) is hydrophilic.
 D) The 3 letter symbol for ___ is Asn.
 E) The 3 letter symbol for ___ is Asp.

1
18
24
32
20
94

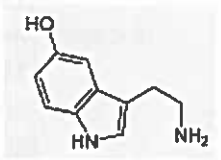
Use the information on the right to answer the following question.

7. (10.1) Which food combination will give a complete protein?
 A) Rice and Corn
 B) Oatmeal and Almonds
 C) Rice and Oatmeal
 D) Beans and Corn
(E) Peas and Corn
 AB) Rice and Almonds

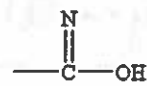
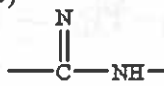
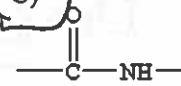
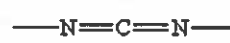
AMINO ACID DEFICIENCY IN SOME FOODS	
Rice	-----Lys
Oatmeal	-----Lys
Peas	-----Met
Beans	-----Trp, Met
Almonds	-----Lys, Trp
Corn	-----Lys, Trp

8. (10.1) Serotonin is an important brain neurotransmitter. What amino acid is serotonin synthesized from?

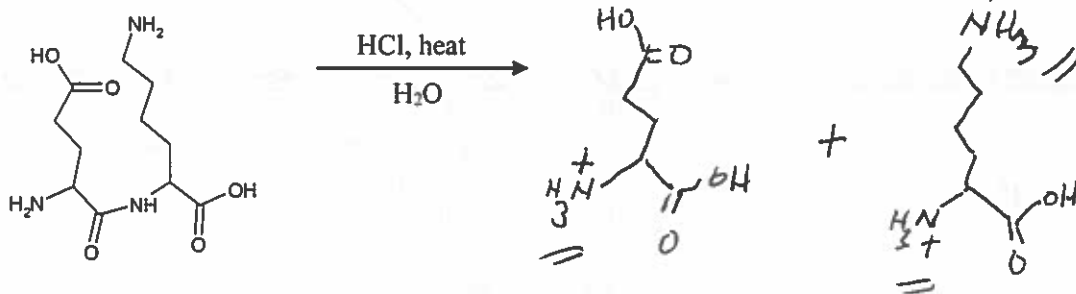
- A) Thr **(B) Trp** C) Tyr D) Val E) Phe



9. (10.2) The structure among the following that represents an amide (protein) bond is:

- A)  B)  **(C) ** D) 

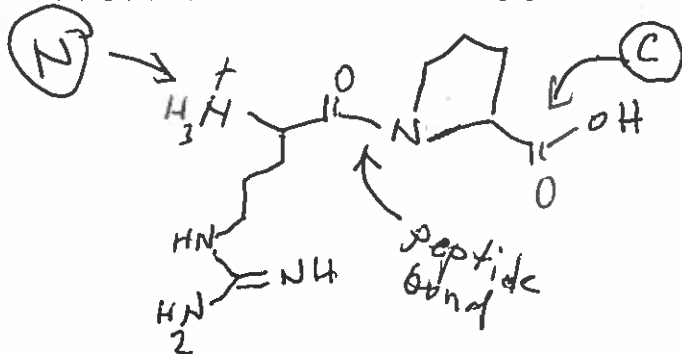
(8 pt) (10.2) Write the structures of the products from acid hydrolysis (pH=0) of the following dipeptide. *Hint: Consider the ionic form of each of the functional groups.*



(6 pt) (10.2) Draw the structural formula of the following dipeptide: arg-pro, then

A) (2 pt) (9.2) Label the N-terminal end and the C terminal ends.

B) (2 pt) (9.2) Mark with an arrow each peptide bond.



(6 pt) (10.2) The following table shows the results of an analysis of a decapeptide that specifies the distribution of amino acids, the N-terminal amino acid, the C-terminal amino acid, and a series of amino acid fragments. Use this to determine the primary structure of this decapeptide and write it in the space provided.

Move the fragments until they are aligned to show the complete original decapeptide.		Question 1 of 10			
Amino Acids:	Ala ... 1 Asn ... 1	Glu ... 1 His ... 1	Ile ... 1 Leu ... 1	Lys ... 1 Phe ... 1	
Terminal Residues:	Asn				Ala
chymotrypsin:	Asn-Lys-Ser-Ile-His-Glu-Phe Leu-Tyr				
pepsin:	Asn-Lys-Ser-Ile-His-Glu Phe-Leu Tyr-Ala				
thermolysin:	Asn-Lys-Ser Ile-His-Glu-Phe Leu-Tyr-Ala				
	???-???-???-???-???-???-???-???-???-???				

Primary structure Asn-Lys-Ser-Ile-His-Glu-Phe-Leu-Tyr-Ala

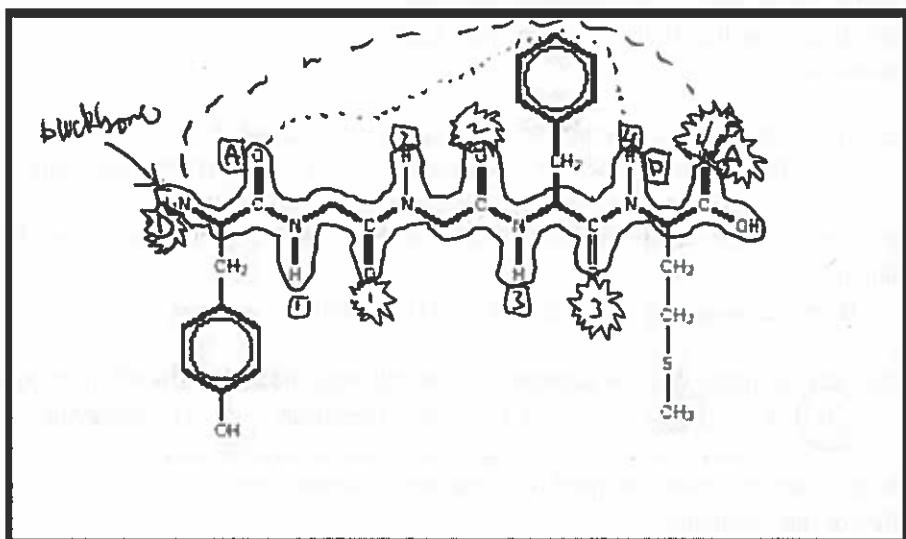
24 pt

ala, gly, val
val, ala, gly
gly, val, ala

gly, ala, val
ala, gly, val
Page 3 of 3
val, gly, ala

10. (10.3) How many tripeptides can be made from one amino acid each of ala, gly and val?
 A) 1 B) 2 C) 3 D) 4 E) 5 **AB) 6** AC) 7 AD) 8 AE) 9

(8 pt) (10.3) For the following peptide:
 A) Outline the 'backbone'.
 B) Show one example of the hydrogen bonding (dotted line) that occurs along the 'backbone' in an alpha helix. Label the donor (d) and the acceptor (a) atoms.



Use these answers for questions 11-17. *Some questions have more than one answer, so mark all that apply.*

A. primary structure B. secondary structure C. tertiary structure D. quaternary structure E) All of them.

11. (10.3) The interaction between the side chains of the amino acids is found in this(these) structure(s). **C, D**

12. (10.3) Peptide bonds join the amino acids in the peptide chain. **A**

13. (10.3) Two polypeptide chains are held together with hydrogen bonds. **D**

14. (10.3) Hydrogen bonding between along the protein "backbone" that gives a coiled shape to the protein. **B**

15. (10.4) What level of protein structure is changed by an egg boiled in water for 10 minutes? **B, C, D**

16. (10.4) What level of protein structure is changed when acid is added to milk to make yogurt? **B, C, D**

17. (10.4) What level of protein structure is changed when hydrolysis of a protein occurs? **A**

(10.5) Match the functions on the right with the proteins in Questions 18-21

18. Hemoglobin	AC	A) Structural support
19. Biological catalysts	AB	B) Bodily movement
20. Keratin, collagen	A	C) Defense against germs
21. Endorphins (peptides)	AE	D) Membrane component
		E) Hormone
		AB) Enzymes
		AC) Transport
		AD) Storage
		AE) Neurotransmitter

22. (10.6) What is the primary function of enzymes?

- A) Neurotransmitters B) Structure C) Transport D) Biochemical catalysts

X 23. (10.6) Which of the following is ~~TRUE~~ ^{FALSE} regarding enzymes.

- A. They are usually made of protein.
B. They are specific for one type of reaction.
 C. They are usually active over a large temperature range.
D. They are classified according to the reactions they catalyze.
E. All of the above are true.

24. (10.6) The area on the enzyme that interacts with the substrate is called the:

- A) active site B) regulatory site C) modulator site D) allosteric site

25. (10.6) Some enzymes require certain metal ions, such as Mg^{2+} or Zn^{2+} , in order to have full activity. This component is called a:

- A) cofactor B) coenzyme C) regulator D) substrate

26. (10.6) The model that explains that the substrate fits exactly into the active site of an enzyme is called:

- A) induced fit B) lock and key C) substrate selectivity D) coenzyme

27. (10.7) What factors can influence the speed of a reaction by an enzyme?

- A) The orientation of the reactants.
B) The weakening of bond energies in the reactants
C) The closeness of the reactants to each other in the active site
 D) All of the above

28. (10.7) A molecule that is similar in terms of the correct structure to the substrate for an enzyme will probably be a:

- A) cofactor B) regulator C) competitive inhibitor D) noncompetitive inhibitor

29. (10.7) The pH of the environment in which an enzyme is located can influence the reactivity because a change in pH:

- A) can hydrolyze the protein
 B) can produce protonation or deprotonation of residues in the active site
C) changes the primary structure
D) affects the optical activity

30. The optimum pH for an enzyme such as hexokinase that phosphorylates glucose in the blood would be:

- A) 2.0 B) 7.5 C) 9.0 D) none of these

pH 7.4

31. Increasing the temperature of an enzyme will:

- A) denature it
B) make the reaction rate increase
C) slow down the reaction
D) have no effect on the enzyme's activity