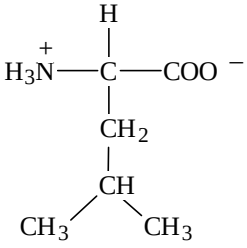
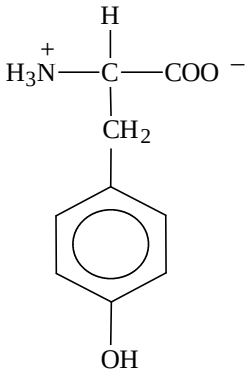
BROOME COMMUNITY COLLEGE
Binghamton, New York

CHM 142 General, Organic and Biochemistry II
Exam 4 - Summer 2004
Name_____

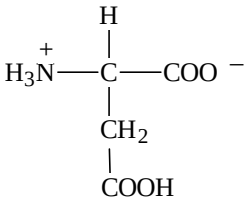
Select the one best answer for multiple choice questions. Be sure to include all hydrogens as H's or dashed lines if a response includes a chemical structure.



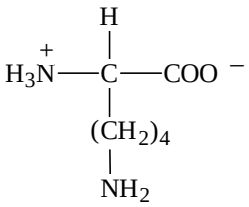
Leucine (Leu)



Tyrosine (Tyr)



Aspartic Acid (Asp)



Lysine (Lys)

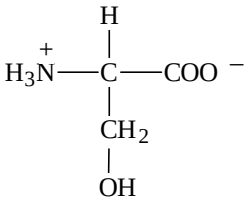
1. Which of the above is a non-polar amino acid?

   a. Leucine b. Tyrosine c. Aspartic acid d. Lysine

2. Which amino acid is most apt to have an isoelectric pH of 9?

   a. Leucine b. Tyrosine c. Aspartic acid d. Lysine

3. The isoelectric pH of the amino acid serine is 5.7. Draw the structure of serine when it is placed in a buffer solution whose pH is 8.



Serine

4. Draw the structure of the tripeptide H_3N-Asp-Tyr-Asp-Leu-COO^-

5. The isoelectric pH of the **protein** egg albumin is 4.7. What will be the charge on egg albumin if the surrounding pH is 2.5?

a. positive b. negative c. neutral d. impossible to tell

6. The fact that hemoglobin consists of four protein chains centered on a heme unit is a demonstration of

a. primary structure b. secondary structure c. tertiary structure d. quaternary structure

7. The secondary structure of a protein is a result of

a. the folding over of a protein chain
b. hydrogen bonds on the backbone of a protein chain
c. hydrogen bonds on the R groups of a protein chain
d. the sequence of amino acids of a protein chain

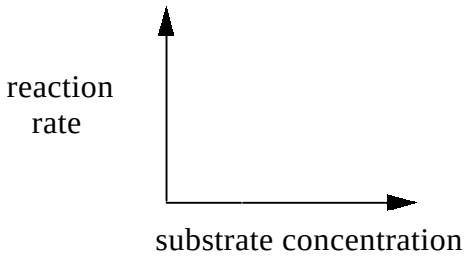
8. Of the amino acids listed on page 1, which is most likely to be found on the inside of a globular protein?

a. Leucine b. Tyrosine c. Aspartic acid d. Lysine

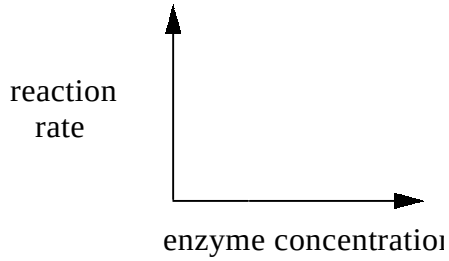
9. Which type of chemical bonding is responsible for the primary structure of proteins?

a. esters b. amides c. amines d. hydrogen bonds

10. Sketch the curve which illustrates reaction rate vs substrate concentration.



11. Sketch the curve which illustrates reaction rate vs enzyme concentration.



12. Which one of the following acts as a messenger in the body?

a. prions b. enzymes c. hormones d. prostaglandins

13. Alcohol dehydrogenase is an enzyme that catalyzes the conversion of ethanol to acetaldehyde. The active enzyme consists of a protein molecule and a zinc ion. The ethanol is called the

a. cofactor b. substrate c. coenzyme d. apoenzyme

14. Which lipoprotein transports "bad" cholesterol?

a. chylomicrons b. VLDLs c. LDLs d. HDLs

15. The number of substrate molecules converted to product in one minute by one enzyme molecule is called the ____ number of an enzyme.

a. activity b. modulation c. optimum d. turnover

16. During severe fasting or starvation there is a

a. positive nitrogen balance b. negative nitrogen balance c. nitrogen equilibrium

17. A deficiency of carbohydrates in the body leads to the formation of

a. acetyl-Coenzyme A
b. insulin
c. glycogen
d. ketone bodies

18. The fat soluble vitamin supplements need to be carefully monitored because

a. they are very expensive
b. overdoses can result in headaches
c. they are incompatible with water soluble vitamins
d. they can accumulate in the fat stores of the body to the point of becoming toxic

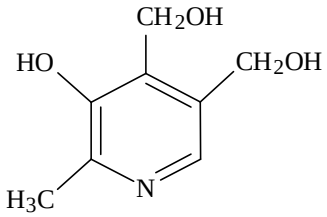
19. Digestion processes begin with

a. oxidation b. reduction c. hydrolysis d. hydrogenation

20. An essential amino acid is one that is

a. is necessary in the diet
b. present at the essential site of an enzyme
c. present at the allosteric site of an enzyme
d. present at the active site of an enzyme

21. Is the following vitamin water soluble? yes no (circle one)



22. What molecules will be produced when the enzyme sucrase reacts?

a. amino acids b. glucose and fructose c. fatty acids and glycerol d. all of these

23. Bile salts serve to:

a. absorb insulin
b. break down glycogen
c. hydrolyze proteins
d. emulsify lipids

24. The preferred energy source for brain cells is

a. amino acids b. glucose c. fatty acids d. vitamins

25. When a hormone causes an increase of cAMP within a cell, the binding site for that hormone is located on a

a. transmembrane protein
b. cholesterol molecule
c. phospholipid molecule
d. glycoprotein

ONE-POINT BONUS QUESTION:

What singer recorded the following:

Look what they done to my brain, Ma.
Look what they done to my brain.
Well, they picked it like a chicken bone,
and I think I'm half insane, Ma
Look what they done to my brain.

WM 06/30/04