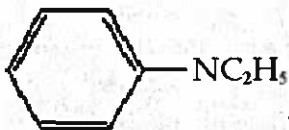
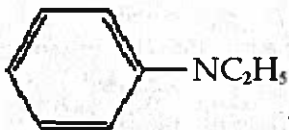


Biochemistry Unit 4 Review**Multiple Choice**

Identify the choice that best completes the statement or answers the question.

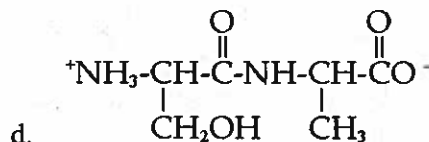
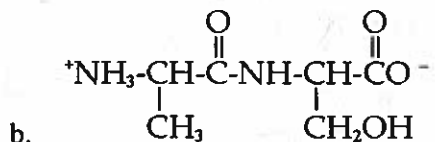
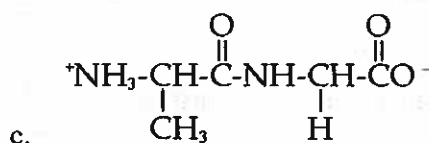
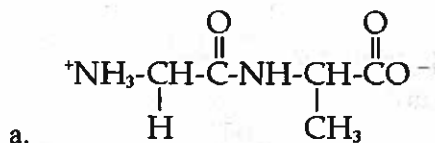
- _____ 1. Nitrogen's abundance among organic compounds is primarily the result of the wide distribution of which class of compounds?
a. amides b. amides c. amines d. imides
- _____ 2. What is the basis for classifying amines as primary, secondary, or tertiary?
a. the number of carbon atoms bonded to a nitrogen atom
b. the number of nitrogen atoms present
c. the number of hydrogen atoms present
d. any of the above may be used
- _____ 3. Which of the following is the simplest aromatic amine?
a. anilamine b. aniline c. anisole d. benzylamine
- _____ 4. What is the maximum number of hydrogen atoms which can be attached to a nitrogen atom in a heterocyclic amine?
a. 0 b. 1 c. 2 d. 3
- _____ 5. Which chemical property of alkaloids is the source of the name alkaloid?
a. their reactivity with metallic elements such as sodium and potassium
b. their reactivity with strong acids
c. their reactivity with strong bases
d. their similarity to alkanes
- _____ 6. When *N*- is part of the IUPAC name of an amine which of the following is true?
a. the amine is a 1° amine c. the amine is a 3° amine
b. the amine is a 2° amine d. the amine has more than one N atom



- _____ 7. What is the common name of  ?
a. ethylaniline c. phenylethylamine
b. ethylphenylamine d. *N*-ethylaniline
- _____ 8. What is the common name of $\text{CH}_2\text{-NH-C}_2\text{H}_5$?
a. ethylmethanamine c. *N*-methylethanamine
b. methylethylamine d. propanamine
- _____ 9. Which of the following is characteristic of relatively low molecular weight amines?
a. they are odorless c. they have strong, pleasant odors
b. they have mild, pleasant odors d. they have pungent, unpleasant odors
- _____ 10. In a pure sample of which of the following is there no hydrogen bonding?
a. CH_3NH_2
b. $(\text{CH}_3)_2\text{NH}$
c. $(\text{CH}_3)_3\text{N}$
d. none, pure samples of all these have hydrogen bonds

- _____ 11. Which of the following is true?
- the N–H bond is nonpolar
 - the N–H bond is polar but its polarity is less than that of the O–H bond
 - the polarity of the N–H bond is the same as that of the O–H bond
 - the polarity of the N–H bond is greater than that of the O–H
- _____ 12. Which of the following is true of the solubility of amines?
- all amines are insoluble in water
 - all amines are soluble in water
 - most low molecular weight amines are soluble in water
 - amines decompose when water is added to them
- _____ 13. Trimethylamine, ethylmethanamine, and propylamine are isomers. Based on their shapes and hydrogen bonding ability which of the following is true regarding their boiling points?
- they all have very nearly the same boiling points, so it is hard to predict the order
 - the predictions based on shape are opposite to those from hydrogen bonding ability, so it is hard to predict the order
 - propylamine < ethylamine < trimethylamine
 - propylamine > ethylamine > trimethylamine
- _____ 14. Which of the following has the highest boiling point?
- butane
 - 1-propanamine
 - 1-propanol
 - 2-propanone
- _____ 15. Which of the following gives the correct order of solubility in water?
- $C_2H_5NH_2 < C_4H_9NH_2 < C_6H_{13}NH_2$
 - $C_2H_5NH_2 < C_6H_{13}NH_2 < C_4H_9NH_2$
 - $C_6H_{13}NH_2 < C_4H_9NH_2 < C_2H_5NH_2$
 - $C_6H_{13}NH_2 < C_2H_5NH_2 < C_4H_9NH_2$
- _____ 16. Although many amines are insoluble in water they can be dissolved in which of the following?
- acids
 - bases
 - both (a) and (b)
 - neither (a) nor (b)
- _____ 17. Although all biological molecules are important, which type of molecules is considered the most important?
- amino acids
 - carbohydrates
 - lipids
 - proteins
- _____ 18. Which functional group is involved in linking together the amino acids of proteins?
- amine
 - amide
 - carbonyl
 - carboxyl
- _____ 19. Proteins are associated with which of the following functions?
- catalysis
 - movement
 - storage
 - all of these
- _____ 20. Which of the following is a structural protein?
- cellulose
 - collagen
 - hemoglobin
 - insulin
- _____ 21. Which of the following is a protein associated with the movement of muscles?
- actin
 - ferritin
 - hemoglobin
 - insulin
- _____ 22. Which of the following is a protein associated the storage of iron?
- actin
 - ferritin
 - hemoglobin
 - insulin
- _____ 23. Which of the following proteins is a hormone?
- casein
 - hemoglobin
 - insulin
 - all of these
- _____ 24. Which of the following is true of the solubility of proteins in water?
- both fibrous and globular proteins are generally insoluble in water
 - both fibrous and globular proteins are generally soluble in water
 - fibrous proteins are generally insoluble in water
 - globular proteins are generally insoluble in water

36. Which of the following is glycylalanine?



37. Which of the following is true of proteins?

- all proteins are acidic
- all proteins are basic
- all proteins are neutral
- the acid/base properties of a protein depend on the identity of its side chains

38. Which of the following defines the primary structure of proteins?

- the geometric arrangement of the backbone atoms
- the geometric arrangement of the side chains
- the sequence of the amino acids
- all of the above

39. How many tripeptides can be made using the 20 standard amino acids?

- 60
- 400
- 6840
- 8000

40. Which of the following correctly describes relationship between the primary structure of a protein and protein function?

- changing one amino acid always affects protein function
- changing one amino acid may or may not affect protein function
- changing one amino acid never affects protein function
- there is no relationship between primary structure and protein function

41. Which of the following is a type of secondary structure?

- α -helix
- β -pleated sheet
- both (a) and (b)
- neither (a) nor (b)

42. Which of the following contributes to the tertiary structure of proteins?

- the sequence of amino acids
- hydrogen bonding within the backbone
- hydrogen bonding between the side chains
- the interaction of protein subunits

43. Which of the following pairs of amino acids can form a salt bridge?

- alanine and glutamic acid
- aspartic acid and lysine
- leucine and phenylalanine
- serine and tyrosine

44. Which of the following pairs of amino acids has hydrophobic interactions?

- alanine and glutamic acid
- aspartic acid and lysine
- leucine and phenylalanine
- serine and tyrosine

45. What is the name for proteins which assist other proteins attain their correct secondary and tertiary structures?

- AGE's
- chaperones
- prions
- proteinoids

Name: _____

ID: A

- _____ 46. Which of the following is associated with the quaternary structure of proteins?
a. the sequence of amino acids
b. hydrogen bonding within the backbone
c. hydrogen bonding between the side chains
d. the interaction of protein subunits
- _____ 47. How many protein chains make up hemoglobin?
a. 1 b. 2 c. 3 d. 4
- _____ 48. Which level of protein structure is not affected by denaturation?
a. primary b. secondary c. tertiary d. quaternary
- _____ 49. Which part of an amino acid determines its behavior?
a. n-terminal c. R side chain
b. c-terminal d. peptide bond
- _____ 50. Due to the nature of amines they can behave as acids or bases, this is called:
a. amphoteric c. alkaloid
b. neutrophile d. zwitterion

Short Answer

51. List the ways an amino acids side chain might be classified.

- A) _____ B) _____
C) _____ D) _____
E) _____ F) _____

52. List the functions of a protein.

- A) _____ B) _____
C) _____ D) _____
E) _____ F) _____
G) _____

53. List the types of connections between amino acid side chains in a polypeptide and where the side chains would be found in the tertiary structure. (refer to what you learned with the protein tubers activity)

- | Type: | Found: |
|----------|--------|
| A) _____ | _____ |
| B) _____ | _____ |
| C) _____ | _____ |
| D) _____ | _____ |

Name: _____

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54. Complete the following illustrations and determine the classification of the amines (1°, 2°, or 3°).

3-methyl pentanamine

Class: _____

N-propyl butanamine

Class: _____

N,N-diethyl propanamine

Class: _____

cyclohexanamine

Class: _____

55. Complete the following illustrations of the peptides. Please illustrate them in the charged Zwitterion state. Label the N-terminal, C-terminal, R-group and peptide bonds.

Glu-Ser-Lys

Asp-Gly-Val