

Biochemistry Unit 4 Test**Multiple Choice**

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

- What is the basis for classifying amines as primary, secondary, or tertiary?
 - the number of carbon atoms bonded to a nitrogen atom
 - the number of nitrogen atoms present
 - the number of hydrogen atoms present
 - any of the above may be used
- Which of the following is the simplest aromatic amine?
 - aniline
 - aniline
 - anisole
 - benzylamine
- Which of the following is true of alkaloids?
 - they are synthetic forms of amines
 - they are composed of alkali metals
 - they are naturally occurring amines
 - none of the above
- When *N,N*- is part of the IUPAC name of an amine which of the following is true?
 - the amine is a 1° amine
 - the amine is a 2° amine
 - the amine is a 3° amine
 - the amine has more than one N atom
- What is the IUPAC name of $\text{CH}_3\text{-NH-C}_2\text{H}_5$?
 - ethylmethanamine
 - methylethylamine
 - N*-methylethanamine
 - propanamine
- What is the IUPAC name of $\text{CH}_3\text{-NH-CH(CH}_3\text{)CH}_3$?
 - methylisopropylamine
 - isopropylmethanamine
 - N*-methyl-2-propanamine
 - none of these
- Which of the following is characteristic of relatively low molecular weight amines?
 - they are odorless
 - they have mild, pleasant odors
 - they have strong, pleasant odors
 - they have pungent, unpleasant odors
- Which type of amines cannot hydrogen bond with water?
 - 1°
 - 2°
 - 3°
 - none, they can all hydrogen bond with water
- Which of the following is true?
 - no amines form hydrogen bonds
 - the N-H---N hydrogen bond is stronger than the O-H---O hydrogen bond
 - the N-H---N hydrogen bond is the same strength as the O-H---O hydrogen bond
 - the N-H---N hydrogen bond is weaker than the O-H---O hydrogen bond

10. Which of the following gives the correct order of boiling points?
a. $C_2H_5OH > C_3H_8 > C_2H_5NH_2$
b. $C_2H_5OH > C_2H_5NH_2 > C_3H_8$
c. $C_3H_8 > C_2H_5OH > C_2H_5NH_2$
d. $C_3H_8 > C_2H_5NH_2 > C_2H_5OH$
11. Which of the following gives the correct order of solubility in water?
a. $C_2H_5OH > C_3H_8 > C_2H_5NH_2$
b. $C_2H_5OH > C_2H_5NH_2 > C_3H_8$
c. $C_3H_8 > C_2H_5NH_2 > C_2H_5OH$
d. $C_3H_8 > C_2H_5OH > C_2H_5NH_2$
12. Although many amines are insoluble in water they can be dissolved in which of the following?
a. acids
b. bases
c. both (a) and (b)
d. neither (a) nor (b)
13. Which functional group is involved in linking together the amino acids of proteins?
a. amine
b. amide
c. carbonyl
d. carboxyl
14. Proteins are associated with which of the following functions?
a. catalysis
b. movement
c. storage
d. all of these
15. Which of the following is a structural protein?
a. cellulose
b. collagen
c. hemoglobin
d. insulin
16. Which of the following is a protein associated with the movement of muscles?
a. actin
b. ferritin
c. hemoglobin
d. insulin
17. Which of the following is a protein associated the storage of iron?
a. actin
b. ferritin
c. hemoglobin
d. insulin
18. Which of the following proteins is a hormone?
a. casein
b. hemoglobin
c. insulin
d. all of these
19. Which of the following is true of the solubility of proteins in water?
a. both fibrous and globular proteins are generally insoluble in water
b. both fibrous and globular proteins are generally soluble in water
c. fibrous proteins are generally soluble in water
d. globular proteins are generally soluble in water
20. How many different amino acids are commonly found in proteins?
a. 10
b. 20
c. 200
d. 1000
21. In which of the following is the amino nitrogen also part of the side chain?
a. cysteine
b. glycine
c. proline
d. tryptophan
22. What is the most important property of the R groups of the amino acids?
a. their polarity
b. their shape
c. their size
d. none of these
23. Which of the following side chains are hydrophilic?
a. acidic
b. basic
c. polar but neutral
d. all of these
24. In which of the following do both amino acids contain a sulfur atom?
a. cysteine and glycine
b. cysteine and methionine
c. histidine and methionine
d. phenylalanine and tryptophan

25. Which of the following is true about zwitterions?
 a. they are positively charged c. they are electrically neutral
 b. they are negatively charged d. the charge depends on the zwitterion
26. What determines the characteristics of an amino acid?
 a. its molecular weight c. both (a) and (b)
 b. the identity of its side chain d. neither (a) nor (b)
27. Amines can donate both electrons to a bond, this classifies them as:
 a. zwitterions b. nucleophiles c. amphoteric d. none of these

28. How is the tripeptide $\text{HOOCCH}_2\text{-CH(NH}_3^+\text{)-C(=O)-NH-CH(CH}_2\text{SH)-C(=O)-NH-CH(CH}_3\text{)-CO}^-$ designated?
 a. ala-cys-asp b. ala-cys-glu c. asp-cys-ala d. glu-cys-ala

29. Which of the following is true of proteins?
 a. all proteins are acidic
 b. all proteins are basic
 c. all proteins are neutral
 d. the acid/base properties of a protein depend on the identity of its side chains
30. How many dipeptides can be made using the 20 standard amino acids?
 a. 20 b. 40 c. 200 d. 400
31. Which of the following is a type of secondary structure?
 a. α -pleated sheet c. both (a) and (b)
 b. β -helix d. neither (a) nor (b)
32. Which type of interaction is not associated with tertiary structure?
 a. covalent bonding
 b. hydrogen bonding
 c. hydrophobic interactions
 d. none, they are all associated with tertiary structure
33. What is the name for proteins which assist other proteins attain their correct secondary and tertiary structures?
 a. AGE's b. chaperones c. prions d. proteinoids
34. 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
35. Which will not denature protein when added to it?
 a. reducing agents c. dihydrogen monoxide
 b. acid/base d. heavy metals

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36. Which level of protein structure is not affected by denaturation?
a. primary b. secondary c. tertiary d. quaternary
37. Which of the following is not possible function of a protein?
a. movement c. support
b. storage d. all are functions of proteins
38. How many amino acids are typically found in a protein?
a. 2 c. 200
b. 20 d. 20000
39. This type of protein is found in muscle tissue and has more than 10,000 amino acids:
a. peptide c. enzymes
b. polypeptide d. titan
40. Which of the following is a type of protein that is mainly used for structure and is inssoluble in water?
a. fibrous protein c. glycoprotein
b. globular protein d. lipoprotein

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Unit 4 Answer Sheet

Complete the following illustrations and determine the classification of the amine (1°, 2°, or 3°)
(illustration 3 pts each/ classification 1 pt each)

41. N-methyl N-ethyl amine

Class: _____

42. N,N-dimethyl pentanamine

Class: _____

43. 2,4 hexane diamine

Class: _____

44. cyclopentanime

Class: _____

Complete the following illustrations of the peptides. Please illustrate them in their **zwitterion** form and label the N-term., C-term., R-groups and peptide bonds.
(illustration 3 pts each/ labeling 1 pt each)

45. Met-Ala-Arg

46. Pro-Tyr-Ile

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Table 1. Mean values of the dependent variables for the different groups and conditions. The values are given as mean (SD) and the number of subjects in parentheses

Group	Condition	Time (s)		Distance (m)		Speed (m/s)		Heart rate (b/min)		Energy (kJ)	
		Start	End	Start	End	Start	End	Start	End	Start	End
Normal	Control	100	100	100	100	100	100	100	100	100	100
		100	100	100	100	100	100	100	100	100	100
	100	100	100	100	100	100	100	100	100	100	100
	100	100	100	100	100	100	100	100	100	100	100
Dyslexic	Control	100	100	100	100	100	100	100	100	100	100
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Dyslexic	Control	100	100	100	100	100	100	100	100	100	100
		100	100	100	100	100	100	100	100	100	100
	100	100	100	100	100	100	100	100	100	100	100
	100	100	100	100	100	100	100	100	100	100	100

Control = control condition; End = end of the trial.

100 = 100% of the maximum value.

SD = standard deviation.

n = number of subjects.

Start = start of the trial.

End = end of the trial.

Speed = speed of the trial.

Heart rate = heart rate of the trial.

Energy = energy of the trial.

Distance = distance of the trial.

Time = time of the trial.

Normal = normal group.

Dyslexic = dyslexic group.

Control = control condition.

Start = start of the trial.

End = end of the trial.

Speed = speed of the trial.

Heart rate = heart rate of the trial.

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