CH 102 Practice exam

This represents the new material that will be on the exam, for review of the older material refer to the two previous exams and the previous practice exams, and of course, the homework.

See you all Monday.

Ted Michelini
True/False

Indicate whether the sentence or statement is true or false.

____ 1. Amine hydrochlorides are usually more soluble than the amine in water.
____ 2. Amines are less basic than amides.
____ 3. The amine salts tend to be less soluble than the amine.
____ 4. The reason that amides are produced from acid chlorides or acid anhydrides is that the acid-amine reaction usually yields a salt, not an amide.
____ 5. Polysaccharides tend to be very sweet.
____ 6. Cellulose is a polysaccharide composed of glucose monomers.
____ 7. The hydrolysis of cellulose and starch would give the same monosaccharide.
____ 8. Gasoline could be classified as a lipid.
____ 9. Fats are saponifiable lipids.
____ 10. An unsaturated fat contains fatty acids that have at least one double bond in the carbon skeleton.
____ 11. The animal fats are classified as esters because of the way they are chemically produced.
____ 12. Both fats and oils produce glycerol and fatty acids when hydrolyzed in an acid solution.
____ 13. Triglycerides are examples of simple lipids.
____ 14. Phosphotriglycerides are examples of complex lipids.
____ 15. Fatty acid micelles in water usually have the hydrophillic groups on the outside of the structure.
____ 16. If a vegetable oil is completely hydrogenated, the product is a solid rather than a liquid.
____ 17. The flexibility of living membranes is to do the strong hydrogen bonding between lipids.
____ 18. When proteins are hydrolyzed, amide bonds are cleaved.
____ 19. Denaturation usually involves a change in the primary structure of the protein.
____ 20. Denaturation is usually easily reversible.
____ 21. Peptide bonds usually are not cleaved in denaturation.
____ 22. The peptide linkage is an amide bond.
____ 23. The formation of a disulfide bond between two cysteine molecules requires oxidation.
____ 24. Whipping of egg white involves protein denaturation.
____ 25. Peptides are named from the N-terminal to the C-terminal. The N-terminal is the nitrogen end of the molecule, and the C-terminal is the carboxylic carbon end of the peptide.
Multiple Choice
Identify the letter of the choice that best completes the statement or answers the question.

____ 26. Which compound is a secondary amine?
   a. \[ \text{CH}_3 \text{N}-\text{CH}_2-\text{CH}_3 \]
   b. \[ \text{CH}_3-\text{NH}-\text{CH}_3 \]
   c. \[ \text{CH}_3\cdot\text{CH}•\text{CH}_3 \]
   d. \[ \text{HC}•\text{NH}•\text{CH}_3 \]

____ 27. The amine \[ \text{CH}_3\cdot\text{CH}•\text{CH}_3 \] is
   a. primary
   b. secondary
   c. tertiary
   d. quaternary

____ 28. Which amine has the lowest boiling point?
   a. \[ \text{CH}_3\cdot\text{CH}_2•\text{CH}_2•\text{NH}_2 \]
   b. \[ \text{CH}_3\cdot\text{N}•\text{CH}_3 \]
   c. \[ \text{CH}_3\cdot\text{CH}_2•\text{NH}•\text{CH}_3 \]
   d. \[ \text{CH}_3•\text{CH}•\text{NH}_2 \]

____ 29. Amines function chemically as organic
   a. acids
   b. bases
   c. neither acids nor bases
   d. both acids and bases
30. What are the products of the reaction \( \text{CH}_3\text{CH}^+\text{NH}_2 + \text{H}_2\text{O} \)?

a. \( \text{CH}_3\text{CH}^+\text{NH}_3 + \text{OH}^- \)

b. \( \text{CH}_3\text{CH}^+\text{OH} + \text{NH}_3 \)

c. \( \text{CH}_3\text{CH}^+\text{NH}^-\text{OH} + \text{H}_2 \)

d. \( \text{CH}_3\text{CH}^+\text{NH}_2 + \text{H}_2 \)

31. Amides are formed as a product of reactions between

a. carboxylic acids and amines

b. acid chlorides or acid anhydrides and amines

c. aldehydes and alcohols

d. amines and alcohols

32. The IUPAC name for \( \text{CH}_3\text{CH}_2\text{C}^\equiv\text{NH}^\equiv\text{CH}_3 \) is

a. N-methylpropionamide

b. N-methylpropanamide

c. 1-methylpropanamide

d. 2-butanamide

33. The amide produced from pentanoic acid and ammonia is

a. N-pentanamide

b. N-methylpentanamide

c. pentanoicamide

d. pentanamide

34. What are the products of the reaction \( \text{CH}_3\text{CH}_2\text{C}^\equiv\text{NH}^\equiv\text{CH}_2\text{CH}_3 + \text{NaOH} \to ? \)?

a. \( \text{CH}_3\text{CH}_2\text{C}^\equiv\text{OH} + \text{CH}_3\text{CH}_2\text{NH}_2 \)

b. \( \text{CH}_3^\equiv\text{CH}_2^\equiv\text{CH}_2^\equiv\text{OH} = \text{CH}_3^\equiv\text{CH}_2^-\text{NH}_3^-\text{Na}^+ \)

c. \( \text{CH}_3\text{CH}_2\text{C}^\equiv\text{O}^-\text{Na}^+ + \text{CH}_3\text{CH}_2^-\text{NH}_3^+\text{Cl}^- \)

d. \( \text{CH}_3\text{CH}_2\text{C}^\equiv\text{O}^-\text{Na}^+ + \text{CH}_3\text{CH}_2^-\text{NH}_2 \)
35. Which of the following is a carbohydrate?
   a. progestin
   b. formaldehyde
   c. galactose
   d. Cholesterol

36. Which of the following functional groups is expected to be found in a carbohydrate?
   a. hydroxy
   b. carbonyl
   c. methyl
   d. amide

37. The simplest carbohydrates are called
   a. monosaccharides
   b. disaccharides
   c. polysaccharides
   d. oligosaccharides

38. Carbohydrates which contain two sugar units chemically linked together are called
   a. monosaccharides
   b. disaccharides
   c. trisaccharides
   d. polysaccharides

39. Which of the following is a disaccharide?
   a. glucose
   b. fructose
   c. galactose
   d. maltose

40. A carbohydrate present in the blood is
   a. sucrose
   b. glucose
   c. fructose
   d. lactose

41. The disaccharide formed during the digestion of starch is
   a. amylase
   b. lactose
   c. maltose
   d. sucrose

42. Maltose upon hydrolysis yields
   a. glucose and galactose
   b. glucose and fructose
   c. only glucose
   d. hydrolysis does not occur

43. A polysaccharide made up of glucose that we can't digest is:
   a. cellulose
   b. glycogen
   c. amylase
   d. amylopectin
44. A functional group present in fats is
   a. an alcohol
   b. an ester
   c. a carboxylic acid
   d. an aldehyde

45. One of the products of hydrolysis of a fat is
   a. an aldehyde
   b. glycerol
   c. an ester
   d. a ketone

46. What is the second product in the reaction:

   ![Reaction Diagram]

   a. fatty acid salt
   b. ester
   c. alcohol
   d. aldehyde

47. Phosphoglycerides differ from glycerides in that one of the hydroxyl groups of glycerol is esterified with
   a. phosphoric acid
   b. phosphorus
   c. choline
   d. serine

48. One feature of the fluid mosaic model of membrane structure is called the
   a. microfilament
   b. pleated sheet
   c. hydrophilic sheet
   d. lipid bilayer

49. Which of the following structural features of amino acids is most responsible for differences in properties of proteins?
   a. the carboxyl group
   b. the amino group
   c. the side chain (R group)
   d. two or more features are about equally responsible

50. The reaction of amino acids to give peptides involves which pair of functional groups?
   a. two amino groups
   b. two carboxyl groups
   c. an amino and a carboxyl group
   d. a carboxyl and an alcohol group
51. Peptides have an N-terminal end and a__________.
   a. T-terminal end
   b. A-terminal end
   c. C-terminal end
   d. O-terminal end

52. A large protein undergoes a hydrolysis reaction. The products are_________
   a. amino acids
   b. glycerol
   c. water
   d. large proteins do not undergo hydrolysis reactions

53. Glycoproteins are a combination of protein and
   a. lipids
   b. carbohydrates
   c. nucleic acids
   d. steroids

54. Which of the following is the best representation of a protein backbone?
   a. [Diagram]
   b. [Diagram]
   c. [Diagram]
   d. [Diagram]

55. The sequence of amino acids in a protein is called the _____ structure.
   a. primary
   b. secondary
   c. tertiary
   d. quaternary

56. A pleated sheet protein structure is called a__________
   a. beta-pleated sheet
   b. alpha-helix
   c. alpha-pleated sheet
   d. beta-helix

57. A corkscrew protein structure is called a
   a. beta-pleated sheet
   b. alpha-helix
   c. alpha-pleated sheet
   d. beta-helix
58. The nonpolar portions of a protein are primarily on the _____ of the molecule.
   a. interior
   b. exterior
   c. iron containing portion
   d. oxygen containing portion

59. Most proteins owe their functions to their three dimensional shape. This shape is produced by__________
   a. Gods delicate little fingers
   b. the beta pleated sheets and alpha helices
   c. a combination of salt bridges, hydrogen bonds, disulfide bridges and hydrophobic interactions between the amino acids
   d. none of the above

60. Protein denaturation results in a disruption of the
   a. primary structure
   b. secondary and tertiary structure
   c. primary and secondary structure
   d. primary, secondary and tertiary structure
### TRUE/FALSE

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### MULTIPLE CHOICE

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