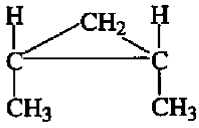
**Name:** _____ **Class:** _____ **Date:** _____ **ID: A**

# Final Organic Biochem Exam Spring 2010

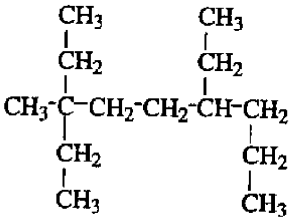
**Multiple Choice**
*Identify the choice that best completes the statement or answers the question.*

____ 1. What is a major difference between inorganic and organic compounds?
a. There are many more inorganic compounds than organic compounds.
b. Organic compounds contain carbon; few inorganic compounds do.
c. Organic compounds are never ionic.
d. Organic compounds tend to be more polar than inorganic compounds

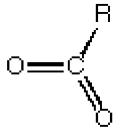
____ 2. Which of the following compounds exhibits structural isomerism?
a. propane
b. methane
c. butane
d. ethane

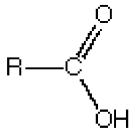
____ 3. The component  is ____-1,2-dimethylcyclopropane.
a. cis
b. trans
c. neither cis nor trans
d. cis and trans isomers are not possible

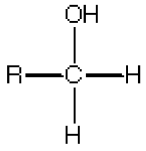
____ 4. Alkanes are ____ in water and ____ than water.
a. insoluble, less dense
b. soluble, less dense
c. insoluble, more dense
d. soluble, more dense

____ 5. Give the IUPAC name for the following 
a. 3,6-diethyl 3-methylnonane
b. 2,2,5,6-tetraethylhexane
c. 2,2,5-triethyloctane
d. none are correct

____ 6. Which of the following is NOT a functional group associated with organic molecules?

a. 

b. 

c. 

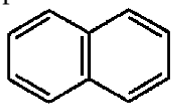
d. All of them are functional groups

____ 7. Select the major product that would result from the reaction:

$$CH_3–CH=CH_2 + H_2O \xrightarrow{H_2SO_4}$$

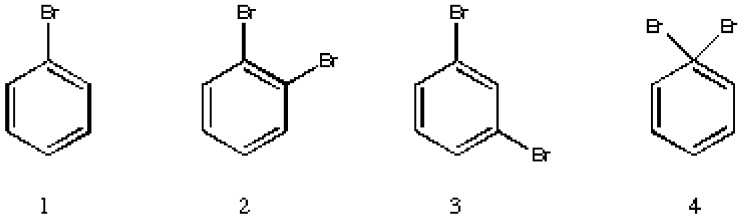
a. $CH_3CH(OH)CH_3$
b. $CH_3CH_2CH_2OH$
c. $CH_3CH_2CH_3$
d. $CH_3CH_2CH_2SO_4$

____ 8. Which of the following compounds is not considered to be aromatic?

a.  b.  c.  d. 

____ 9. Another acceptable name for 1-ethyl-3-methylbenzene is
a. *m*-ethylmethyltoluene
b. *o*-ethylmethyltoluene
c. *p*-ethylmethyltoluene
d. *m*-ethyltoluene

____ 10. Which of the following compounds is not possible:



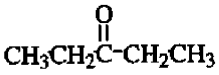
1 2 3 4

a. 1
b. 3
c. 2
d. 4

____ 11. To which class of compounds does cholesterol belong?
a. an aromatic compound
b. an ether
c. a multiple chain cyclic compound
d. an alcohol

____ 12. Which compound would be the most soluble in water?
a. $CH_3–O–CH_2–CH_2–CH_3$
b. $CH_3–CH_2–CH_2–CH_2–CH_3$
c. $CH_3–CH_2–O–CH_2–CH_3$
d. $CH_3–CH_2–CH_2–CH_2–OH$

____ 13. Which of the following alcohols would be the most difficult to oxidize?
a. $CH_2C(OH)(CH_3)_2$
b. $CH_2CH(OH)CH_2(CH_3)_2$
c. $CH_3OH$
d. $HOCH_2CH_2OH$

____ 14. Which of the following compounds would you expect to be foul smelling?
a. $CH_3CH_2CH_2OH$
b. $CH_3CH_2CH_2SH$
c. $CH_3CH_2CH_2CH_3$
d. 

____ 15. Dehydration of an alcohol will produce?
a. an alcohol
b. an ether
c. either an alcohol or ether depending on the reaction conditions
d. a ketone

____ 16. What is the group that distinguishes aldehydes from most other classes of compounds?
a. carboxyl
b. carbonyl
c. hydroxy
d. amide

____ 17. Which of the following products is formed when hydrogen is reacted with 3-methyl-2-butanone?
a. a primary alcohol
b. a secondary alcohol
c. a tertiary alcohol
d. an acetal

____ 18. A positive Benedict's test is indicated by the formation of:
a. $Cu_2O$
b. Cu
c. $Cu^{2+}$
d. a metallic mirror

____ 19. What is the major difference between a cyclic hemiacetal and a cyclic acetal?
a. The cyclic hemiacetal is an alcohol, whereas the cyclic acetal is an ether.
b. The cyclic hemiacetal is an acid, and the cyclic acetal is a base.
c. The cyclic hemiacetal contains more carbons in the ring than the cyclic acetal.
d. All of the responses are correct.

____ 20. Which of the following is the substance that causes the symptoms associated wth a 'hangover'?
a. methanal
b. 2-octanone
c. ethanal
d. benzaldehyde

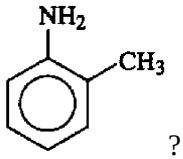
____ 21. When a carboxylic acid reacts with alcohol, the organic product is
a. an acetal
b. a hemiacetal
c. an ester
d. a salt

____ 22. The pleasant, characteristic odor of fruit flavorings is often associated with the presence of
a. carboxylic acids
b. carboxylic salts
c. esters
d. aldehydes

____ 23. What would be the products if ethyl stearate were to undergo hydrolysis?
a. There would be no products as compounds of this nature do not undergo hydrolysis.
b. The products would be ethylaldehyde and stearone.
c. The products would be ethanol and stearic acid.
d. The products would be ethyl stearate hydrate.

____ 24. Reacting a carboxylic acid with a base will produce?
a. an ester
b. no reaction
c. a carboxylate salt
d. an anhydride

____ 25. Which of the following statements about carboxylic acids is true?
a. All are weak acids.
b. Produce hydrogen ions in water.
c. Will react with strong bases.
d. All of the choices.

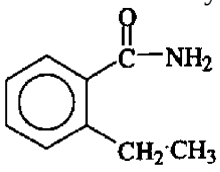
____ 26. What is the correct IUPAC name for 

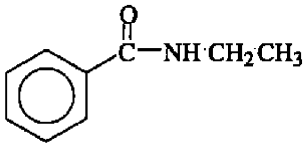
?
a. N-methylaniline
b. 2-methylaniline
c. 1-methylaniline
d. 1-methyl-2-aniline

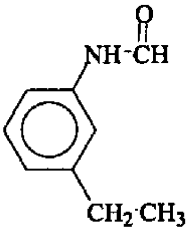
____ 27. Some amine drugs are administered in the form of salts in order to
a. make them form into pills more easily
b. make them taste better
c. make them more basic
d. make them more soluble in body fluids

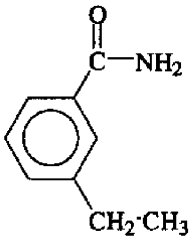
____ 28. An alkaloid present in some cough syrups is
a. morphine
b. cocaine
c. codeine
d. methadone

____ 29. The structure of 2-ethylbenzamide is

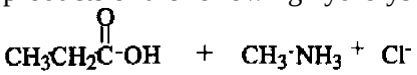
a. 

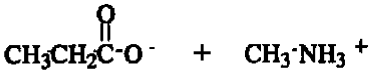
b. 

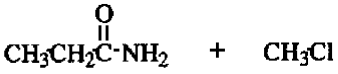
c. 

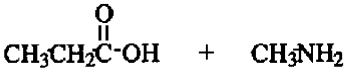
d. 

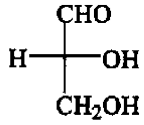
____ 30. The products of the following hydrolysis are 

a. 

b. 

c. 

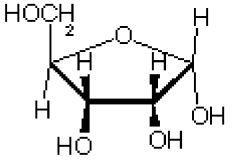
d. 



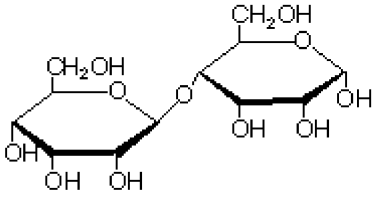
____ 31. The structure is shown in
a. a D form
b. an L form
c. neither D nor L
d. both D and L

____ 32. Which form of monosaccharides are preferred by human cells?
a. D
b. L
c. both D and L
d. neither D nor L

____ 33. A carbohydrate present in the blood is
a. sucrose
b. glucose
c. fructose
d. maltose




____ 34. The struture is shown in what anomeric form?
a. α
b. β
c. cis
d. trans




____ 35. The structure has what type of glycosidic linkage?
a. α(1→6)
b. β(1→4)
c. β(1→6)
d. α(1→4)

____ 36. Which of the following is a characteristic of a lipid?
a. Most lipids are soluble in water.
b. Most lipids are waxy.
c. Lipids are found only animals.
d. Most lipids are high density compounds.

____ 37. Which reaction is involved in preparing margarine from corn oil?
a. hydrolysis
b. hydrogenation
c. saponification
d. esterification

____ 38. Waxes differ from fats and oils in that
a. no fatty acids are produced upon hydrolysis
b. they are not easily hydrolyzed
c. the alcohol produced upon hydrolysis is not glycerol
d. more than one response is correct

____ 39. Upon hydrolysis, which of the following lipids would yield a carbohydrate as a product?
a. phosphoglycerides
b. lecithins
c. cephalins
d. glycolipids

____ 40. Steroids are classified as lipids because they have this distinguishing feature: they
a. dissolve in nonpolar solvents
b. are present in biological materials
c. can be saponified
d. have a ring structure

____ 41. An alpha amino acid contains
a. an amino group on the carbon next to the carboxylate group
b. two amino groups
c. two carboxyl groups
d. an amino group on the end carbon

____ 42. Which of the following is not a protein?
a. enzymes
b. antibodies
c. collagen
d. all these substances are proteins

____ 43. Which of the following terms best describes a typical protein?
a. polyester
b. polypeptide
c. acetal
d. glycoside

____ 44. The major difference between normal hemoglobin and that of sickle cell anemia is
a. sickle cell hemoglobin is the L isomer and the normal is the D isomer
b. sickle cell hemoglobin is a much smaller molecule than normal hemoglobin
c. sickle cell hemoglobin is assembled in a reverse manner
d. sickle cell hemoglobin has one different amino acid in each $\beta$-chain

____ 45. Cross links between peptide chains resulting from interactions of the side chains contribute to which type of protein structural feature?
a. primary
b. secondary
c. tertiary
d. more than one response is correct

____ 46. Which of the following terms can be used correctly to fill the blank in the following equation?
apoenzyme + ____ $\rightarrow$ active enzyme

a. zymogen
b. cofactor
c. isozyme
d. substrate

____ 47. Which of the following is a common function of many vitamins in the body?
a. substrates
b. apoenzymes
c. coenzymes
d. activators

____ 48. The theory that proposes a somewhat flexible enzyme conformation is the
a. lock-and-key theory
b. induced-fit theory
c. physically-fit theory
d. expanding-fit theory

____ 49. An enzyme is operating at its optimum pH. If the pH were increased, how would the rate of the enzyme-catalyzed reaction change?
a. increase
b. decrease
c. could increase or decrease
d. would not change

____ 50. Heavy metal ions are believed to act as ____ inhibitors.
a. reversible
b. irreversible
c. competitive
d. noncompetitive

____ 51. Which of the following comprise a nucleic acid backbone?
a. sugar and base units
b. phosphate and base units
c. phosphate and sugar units
d. sugar, phosphate and base units

____ 52. Replication of DNA produces two daughter DNA molecules in which
a. one daughter molecule contains both parent strands and one daughter molecule contains both newly synthesized strands
b. each daughter molecule contains one parent strand and one newly synthesized strand
c. each daughter molecule contains two newly synthesized strands
d. each daughter molecule contains both parent strands

____ 53. Which nucleic acid is formed during transcription?
a. DNA
b. rRNA
c. tRNA
d. mRNA

____ 54. Which of the following represents the correct order in the flow of genetic information?
a. mRNA→DNA→proteins
b. mRNA→tRNA→proteins
c. DNA→mRNA→proteins
d. rRNA→mRNA→proteins

____ 55. Viruses infect cells by
a. embedding in cell membranes
b. immediate destruction of cells
c. injecting their nucleic acid into cells
d. withdrawing cellular contents

____ 56. Codons provide the information needed to synthesize:
a. mRNA
b. tRNA
c. DNA
d. proteins

____ 57. How many three-letter combinations are present in the genetic code?
a. 32 b. 64 c. 16 d. 88

____ 58. To which of the following do amino acids bind during protein synthesis?
a. DMA
b. tRNA
c. rRNA
d. mRNA

____ 59. Movement of a ribosome along a mRNA is termed
a. translocation
b. lateration
c. elongation
d. translation

____ 60. The molecular basis of a mutation is most closely linked to a
a. defect in the transcription of a genetic message to mRNA
b. change in the sequence of bases on a DNA molecule
c. defect in the rRNA of ribosomes
d. misplaced stop codon

____ 61. Which of the following nutritional guidelines is now officially endorsed in the United States?
a. Minimum Daily Requirements (MDR)
b. Recommended Dietary Allowances (RDA)
c. Daily Value (DV)
d. more than one response is correct

____ 62. Which of the following is correctly called a complex carbohydrate?
a. sucrose
b. lactose
c. fructose
d. starch

____ 63. Which of the following are important contributions made by dietary lipids?
a. good energy sources
b. provide essential fatty acids
c. help carry fat-soluble vitamins through the body
d. more than one response is correct

____ 64. What is a risk(s) of a vegetarian diet?
a. hypertension
b. low intake of essential amino acids
c. deficient in vitamins
d. more than one response is correct

____ 65. The vitamin C deficiency disease is
a. pellagra
b. beriberi
c. scurvy
d. pernicious anemia

____ 66. Which fat-soluble vitamin is involved in the process of blood clot formation?
a. vitamin A
b. vitamin D
c. vitamin E
d. vitamin K

____ 67. Calcium is a mineral that is required by humans for
a. bone and teeth formation
b. blood production
c. blood buffer system
d. there is more than one correct response

____ 68. Most cellular ATP is produced within the
a. nucleus
b. mitochondria
c. chloroplast
d. cytoplasm

____ 69. Which of the following vitamins can a person overdose if taken in high levels?
a. vitamin B12
b. folic acid
c. vitamin C
d. vitamin E

____ 70. What units are used for protein, vitamins and minerals on food labels?
a. Reference Daily Intakes (RDI)
b. Daily Reference Values (DRV)
c. Food and Drug Administration (FDA)
d. Food Guide Pyramid (FGP)

____ 71. A key organ in regulating blood glucose levels is the
a. heart
b. liver
c. adrenal cortex
d. thyroid

____ 72. Which of the following is a product of glycolysis?
a. pyruvate
b. $CO_2 + H_2O$
c. lactase
d. acetyl CoA

____ 73. Under aerobic conditions in the body, pyruvate is converted to
a. lactate
b. acetyl CoA
c. ethanol
d. acetaldehyde

____ 74. The bulk of the energy utilized by marathon runners is provided by
a. blood glucose
b. glycogen
c. protein
d. fatty acids

____ 75. The main source of energy for the brain is
a. glucose
b. fatty acids
c. glycogen
d. glycerol

____ 76. Which of the following hormones acts to lower the blood glucose level?
a. glucagon
b. insulin
c. epinephrine
d. more than one response is correct

____ 77. Which of the following hormones acts to raise the blood glucose level?
a. glucagon
b. insulin
c. epinephrine
d. more than one response is correct

____ 78. Which of the following is not an energy source used in metabolism?
a. UTP
b. ATP
c. GTP
d. UTC

____ 79. Which of the following occurs in the citric acid cycle?
a. oxidation of carbon
b. generation of ATP
c. 'pumping' of hydrogen ions
d. more than one answer is correct

____ 80. Lactate, prduced in the muscles, is sent to the liver for processing. This is one step of ____.
a. the citric acid cycle
b. the cori cycle
c. glycolysis
d. oxidative phosphorylation

____ 81. The accumulation of ketone bodies in the blood is termed
a. acidosis
b. alkalosis
c. ketonuria
d. ketonemia

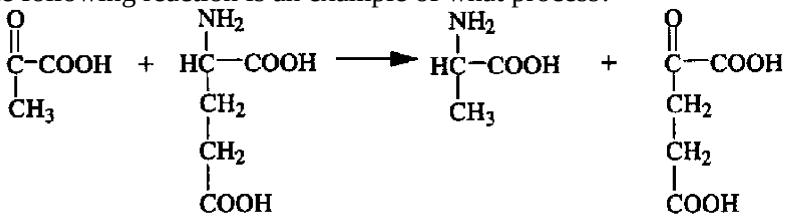
____ 82. The synthesis of fatty acids
a. takes place by simply the reverse reactions of the fatty acid spiral
b. takes place in the same location within a cell as the fatty acid spiral
c. takes place by different reactions than the reverse of the fatty acid spiral and in a different cellular location.
d. more than one response is correct

____ 83. The most important function of amino acids (in terms of amount used) is for the synthesis of
a. body proteins
b. glucose
c. pyruvate for energy production
d. purines and pyrimidines

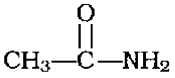
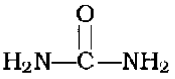
____ 84. The amino acid pool is the total cellular supply of
a. amino acids
b. dipeptides that yield amino acids
c. proteins that yield amino acids
d. more than one response is correct

____ 85. Amino acids of the amino acid pool can be supplied by
a. dietary amino acids
b. the breakdown of tissue proteins
c. the synthesis of nonessential amino acids
d. more than one response is correct

____ 86. The following reaction is an example of what process?



a. transamination
b. deaminiation
c. decarboxylation
d. aminogenesis

____ 87. The nitrogen-containing product of the urea cycle is
a. $CH_3CH_3$
b. 
c. $NH_4^+$
d. 

____ 88. Amino acids that are degraded into ____ are termed glucogenic amino acids.
a. acetyl CoA
b. acetoacetyl CoA
c. pyruvate
d. aspartate

____ 89. Ten amino acids can be synthesized from intermediates of
a. glycolysis and the citric acid cycle
b. glycolysis and the electron transport chain
c. the urea cycle and the electron transport chain
d. the urea cycle and the citric acid cycle

____ 90. What is the effect on acetoacetate blood concentration as weeks without food increases?
a. increases
b. no effect
c. decreases
d. not enough information

____ 91. Which of the following fluids are nearly identical except for protein content?
a. plasma and intracellular fluid
b. plasma and interstitial fluid
c. intracellular and interstitial fluid
d. extracellular and intracellular

____ 92. Which of the following is considered to be a normal constituent of urine?
a. protein
b. ketone bodies
c. amino acids
d. hemoglobin

____ 93. The body loses water through the
a. kidneys
b. lungs
c. skin
d. more than one response is correct

____ 94. Blood has an approximate pH of
a. 6.4 b. 7.0 c. 7.4 d. 8.0

____ 95. Which of the following functions is essential in maintaining a constant pH for the blood?
a. respiration reactions associated with breathing
b. kidney activity
c. formation and excretion of perspiration
d. more than one response is correct

____ 96. Which buffer system is closely linked to the respiratory system?
a. bicarbonate
b. phosphate
c. protein
d. pyruvate

____ 97. Excessive vomiting can lead to a condition of
a. metabolic acidosis
b. metabolic alkalosis
c. respiratory acidosis
d. respiratory alkalosis

____ 98. A patient comes in with all the signs of Jaundice. You order a test of the patient's urine. What constituent in the urine would you be looking for at elevated levels?
a. glucose
b. protein
c. ketone bodies
d. bile pigments

____ 99. A 1 pint donation of blood decreases the body's total blood volume by about
a. 5% b. 10% c. 15% d. 20%

____ 100. Hyperventilation occurs when too much carbon dioxide is exhaled. According to Le Châtelier's principle which way will the equilibrium shift to restore the lost $CO_2$?

a. right
b. no effect
c. left
d. need more information

# Final Organic Biochem Exam Spring 2010
# Answer Section

## MULTIPLE CHOICE

1. ANS: B PTS: 1
2. ANS: C PTS: 1
3. ANS: A PTS: 1
4. ANS: A PTS: 1
5. ANS: A PTS: 1
6. ANS: A PTS: 1
7. ANS: A PTS: 1
8. ANS: C PTS: 1
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37. ANS: B PTS: 1
38. ANS: D PTS: 1
39. ANS: D PTS: 1

40. ANS: A PTS: 1
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43. ANS: B PTS: 1
44. ANS: D PTS: 1
45. ANS: C PTS: 1
46. ANS: B PTS: 1
47. ANS: C PTS: 1
48. ANS: B PTS: 1
49. ANS: B PTS: 1
50. ANS: B PTS: 1
51. ANS: C PTS: 1
52. ANS: B PTS: 1
53. ANS: D PTS: 1
54. ANS: C PTS: 1
55. ANS: C PTS: 1
56. ANS: D PTS: 1
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59. ANS: A PTS: 1
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62. ANS: D PTS: 1
63. ANS: D PTS: 1
64. ANS: D PTS: 1
65. ANS: C PTS: 1
66. ANS: D PTS: 1
67. ANS: A PTS: 1
68. ANS: B PTS: 1
69. ANS: D PTS: 1
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78. ANS: D PTS: 1
79. ANS: A PTS: 1
80. ANS: B PTS: 1
81. ANS: D PTS: 1
82. ANS: C PTS: 1
83. ANS: A PTS: 1

84. ANS: A PTS: 1
85. ANS: D PTS: 1
86. ANS: A PTS: 1
87. ANS: D PTS: 1
88. ANS: C PTS: 1
89. ANS: A PTS: 1
90. ANS: A PTS: 1
91. ANS: B PTS: 1
92. ANS: C PTS: 1
93. ANS: D PTS: 1
94. ANS: C PTS: 1
95. ANS: D PTS: 1
96. ANS: A PTS: 1
97. ANS: B PTS: 1
98. ANS: D PTS: 1
99. ANS: B PTS: 1
100. ANS: A PTS: 1

**Name:** _____ **Class:** _____ **Date:** _____ **ID: B**

# Final Organic Biochem Exam Spring 2010

**Multiple Choice**
*Identify the choice that best completes the statement or answers the question.*

____ 1. Which of the following is a characteristic of a lipid?
a. Most lipids are waxy.
b. Most lipids are high density compounds.
c. Most lipids are soluble in water.
d. Lipids are found only animals.

____ 2. Which form of monosaccharides are preferred by human cells?
a. D
b. L
c. both D and L
d. neither D nor L

____ 3. Which of the following alcohols would be the most difficult to oxidize?
a. $HOCH_2CH_2OH$
b. $CH_2C(OH)(CH_3)_2$
c. $CH_3OH$
d. $CH_2CH(OH)CH_2(CH_3)_2$

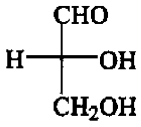
____ 4. The synthesis of fatty acids
a. takes place by simply the reverse reactions of the fatty acid spiral
b. more than one response is correct
c. takes place by different reactions than the reverse of the fatty acid spiral and in a different cellular location.
d. takes place in the same location within a cell as the fatty acid spiral

____ 5. Calcium is a mineral that is required by humans for
a. bone and teeth formation
b. there is more than one correct response
c. blood production
d. blood buffer system

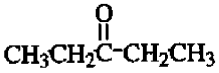
____ 6. How many three-letter combinations are present in the genetic code?
a. 16 b. 64 c. 32 d. 88

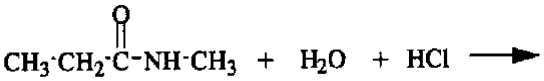
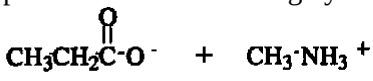
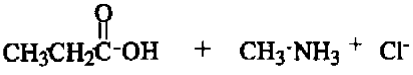
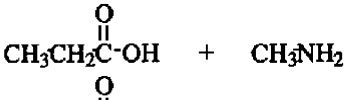
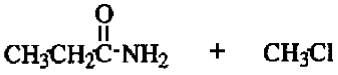
____ 7. What is the major difference between a cyclic hemiacetal and a cyclic acetal?
a. The cyclic hemiacetal contains more carbons in the ring than the cyclic acetal.
b. The cyclic hemiacetal is an acid, and the cyclic acetal is a base.
c. The cyclic hemiacetal is an alcohol, whereas the cyclic acetal is an ether.
d. All of the responses are correct.

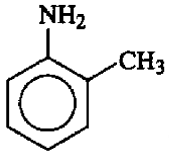
____ 8. Which compound would be the most soluble in water?
a. $CH_3–CH_2–O–CH_2–CH_3$
b. $CH_3–CH_2–CH_2–CH_2–OH$
c. $CH_3–CH_2–CH_2–CH_2–CH_3$
d. $CH_3–O–CH_2–CH_2–CH_3$



____ 9. The structure is shown in
a. an L form
b. a D form
c. neither D nor L
d. both D and L

____ 10. Which of the following compounds would you expect to be foul smelling?
a. $CH_3CH_2CH_2CH_3$
b. $CH_3CH_2CH_2SH$
c. $CH_3CH_2CH_2OH$
d. 

____ 11. The products of the following hydrolysis are 
a. 
b. 
c. 
d. 

____ 12. What is the correct IUPAC name for  ?
a. N-methylaniline
b. 2-methylaniline
c. 1-methyl-2-aniline
d. 1-methylaniline

____ 13. Which of the following vitamins can a person overdose if taken in high levels?
a. vitamin B12
b. vitamin C
c. folic acid
d. vitamin E

____ 14. What is the group that distinguishes aldehydes from most other classes of compounds?
a. carbonyl
b. amide
c. hydroxy
d. carboxyl

____ 15. Which of the following comprise a nucleic acid backbone?
a. phosphate and base units
b. sugar and base units
c. phosphate and sugar units
d. sugar, phosphate and base units

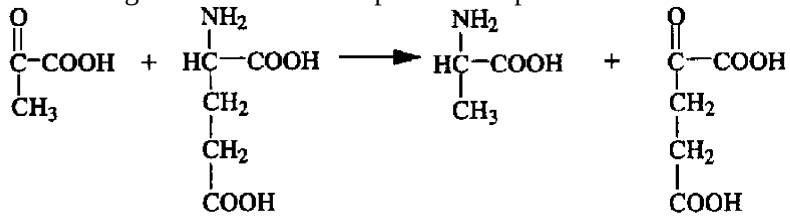
____ 16. The major difference between normal hemoglobin and that of sickle cell anemia is
a. sickle cell hemoglobin is assembled in a reverse manner
b. sickle cell hemoglobin is the L isomer and the normal is the D isomer
c. sickle cell hemoglobin is a much smaller molecule than normal hemoglobin
d. sickle cell hemoglobin has one different amino acid in each $\beta$-chain

____ 17. The body loses water through the
a. kidneys
b. skin
c. lungs
d. more than one response is correct

____ 18. The theory that proposes a somewhat flexible enzyme conformation is the
a. expanding-fit theory
b. physically-fit theory
c. lock-and-key theory
d. induced-fit theory

____ 19. Movement of a ribosome along a mRNA is termed
a. translation
b. translocation
c. elongation
d. lateration

____ 20. The following reaction is an example of what process?



a. aminogenesis
b. decarboxylation
c. transamination
d. deaminiation

____ 21. A key organ in regulating blood glucose levels is the
a. adrenal cortex
b. liver
c. heart
d. thyroid

____ 22. Heavy metal ions are believed to act as ____ inhibitors.
a. irreversible
b. competitive
c. noncompetitive
d. reversible

____ 23. The accumulation of ketone bodies in the blood is termed
a. alkalosis
b. ketonuria
c. acidosis
d. ketonemia

____ 24. What is a major difference between inorganic and organic compounds?
a. There are many more inorganic compounds than organic compounds.
b. Organic compounds tend to be more polar than inorganic compounds
c. Organic compounds are never ionic.
d. Organic compounds contain carbon; few inorganic compounds do.

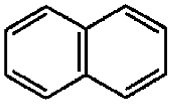
____ 25. Ten amino acids can be synthesized from intermediates of
a. glycolysis and the electron transport chain
b. the urea cycle and the citric acid cycle
c. the urea cycle and the electron transport chain
d. glycolysis and the citric acid cycle

____ 26. The molecular basis of a mutation is most closely linked to a
a. misplaced stop codon
b. defect in the transcription of a genetic message to mRNA
c. defect in the rRNA of ribosomes
d. change in the sequence of bases on a DNA molecule

____ 27. Excessive vomiting can lead to a condition of
a. respiratory acidosis
b. metabolic acidosis
c. metabolic alkalosis
d. respiratory alkalosis

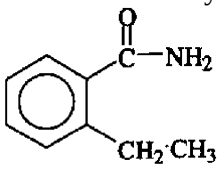
____ 28. Under aerobic conditions in the body, pyruvate is converted to
a. ethanol
b. acetaldehyde
c. lactate
d. acetyl CoA

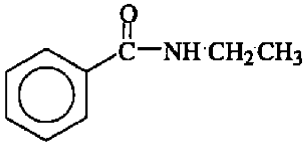
____ 29. A 1 pint donation of blood decreases the body's total blood volume by about
a. 5% b. 15% c. 20% d. 10%

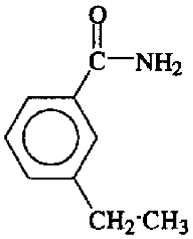
____ 30. Which of the following compounds is not considered to be aromatic?
a.  b.  c.  d. 

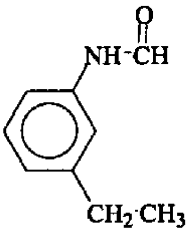
____ 31. Upon hydrolysis, which of the following lipids would yield a carbohydrate as a product?
a. phosphoglycerides
b. cephalins
c. glycolipids
d. lecithins

____ 32. The structure of 2-ethylbenzamide is

a. 

b. 

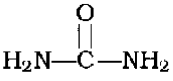
c. 

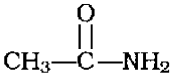
d. 

____ 33. The nitrogen-containing product of the urea cycle is

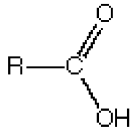
a. $CH_3CH_3$

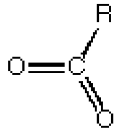
b. $NH_4^+$

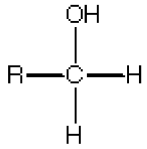
c. 

d. 

____ 34. Which of the following is NOT a functional group associated with organic molecules?

a. 

b. 

c. 

d. All of them are functional groups

____ 35. Steroids are classified as lipids because they have this distinguishing feature: they
a. can be saponified
b. have a ring structure
c. dissolve in nonpolar solvents
d. are present in biological materials

____ 36. Some amine drugs are administered in the form of salts in order to
a. make them form into pills more easily
b. make them more basic
c. make them more soluble in body fluids
d. make them taste better

____ 37. Codons provide the information needed to synthesize:
a. tRNA
b. DNA
c. proteins
d. mRNA

____ 38. Amino acids that are degraded into ____ are termed glucogenic amino acids.
a. acetyl CoA
b. pyruvate
c. aspartate
d. acetoacetyl CoA

____ 39. Blood has an approximate pH of
a. 7.4 b. 6.4 c. 8.0 d. 7.0

____ 40. Dehydration of an alcohol will produce?
a. an ether
b. an alcohol
c. a ketone
d. either an alcohol or ether depending on the reaction conditions

____ 41. Which of the following fluids are nearly identical except for protein content?
a. extracellular and intracellular
b. plasma and intracellular fluid
c. plasma and interstitial fluid
d. intracellular and interstitial fluid

____ 42. Which of the following products is formed when hydrogen is reacted with 3-methyl-2-butanone?
a. an acetal
b. a secondary alcohol
c. a tertiary alcohol
d. a primary alcohol

____ 43. An enzyme is operating at its optimum pH. If the pH were increased, how would the rate of the enzyme-catalyzed reaction change?
a. would not change
b. could increase or decrease
c. decrease
d. increase

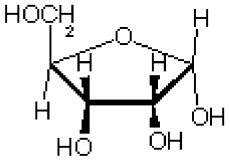
____ 44. Viruses infect cells by
a. embedding in cell membranes
b. immediate destruction of cells
c. injecting their nucleic acid into cells
d. withdrawing cellular contents

____ 45. A carbohydrate present in the blood is
a. maltose
b. sucrose
c. glucose
d. fructose

____ 46. Which of the following terms can be used correctly to fill the blank in the following equation?
apoenzyme + ____ → active enzyme

a. zymogen
b. substrate
c. cofactor
d. isozyme

____ 47. Which of the following is a product of glycolysis?
a. acetyl CoA
b. pyruvate
c. lactase
d. $CO_2 + H_2O$

____ 48. The struture  is shown in what anomeric form?
a. trans
b. cis
c. α
d. β

____ 49. The main source of energy for the brain is
a. glucose
b. fatty acids
c. glycerol
d. glycogen

____ 50. The most important function of amino acids (in terms of amount used) is for the synthesis of
a. pyruvate for energy production
b. body proteins
c. glucose
d. purines and pyrimidines

____ 51. Which nucleic acid is formed during transcription?
a. mRNA
b. tRNA
c. DNA
d. rRNA

____ 52. The pleasant, characteristic odor of fruit flavorings is often associated with the presence of
a. aldehydes
b. carboxylic acids
c. carboxylic salts
d. esters

____ 53. Which of the following compounds exhibits structural isomerism?
a. propane
b. methane
c. butane
d. ethane

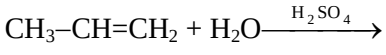
____ 54. A positive Benedict's test is indicated by the formation of:
a. $Cu^{2+}$
b. Cu
c. $Cu_2O$
d. a metallic mirror

____ 55. Which of the following is the substance that causes the symptoms associated wth a 'hangover'?
a. ethanal
b. methanal
c. 2-octanone
d. benzaldehyde

____ 56. What is a risk(s) of a vegetarian diet?
a. deficient in vitamins
b. more than one response is correct
c. hypertension
d. low intake of essential amino acids

____ 57. Which of the following occurs in the citric acid cycle?
a. oxidation of carbon
b. generation of ATP
c. more than one answer is correct
d. 'pumping' of hydrogen ions

____ 58. Select the major product that would result from the reaction:



a. $CH_3CH_2CH_3$
b. $CH_3CH(OH)CH_3$
c. $CH_3CH_2CH_2OH$
d. $CH_3CH_2CH_2SO_4$

____ 59. Which of the following are important contributions made by dietary lipids?
a. help carry fat-soluble vitamins through the body
b. provide essential fatty acids
c. more than one response is correct
d. good energy sources

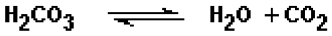
____ 60. Which of the following hormones acts to lower the blood glucose level?
a. epinephrine
b. more than one response is correct
c. insulin
d. glucagon

____ 61. An alpha amino acid contains
a. two carboxyl groups
b. an amino group on the end carbon
c. two amino groups
d. an amino group on the carbon next to the carboxylate group

____ 62. Which reaction is involved in preparing margarine from corn oil?
a. esterification
b. hydrogenation
c. saponification
d. hydrolysis

____ 63. Which of the following is correctly called a complex carbohydrate?
a. sucrose
b. fructose
c. starch
d. lactose

____ 64. Hyperventilation occurs when too much carbon dioxide is exhaled. According to Le Châtelier's principle which way will the equilibrium shift to restore the lost $CO_2$?



a. left
b. need more information
c. right
d. no effect

____ 65. Which of the following is not an energy source used in metabolism?
a. ATP
b. GTP
c. UTP
d. UTC

____ 66. To which class of compounds does cholesterol belong?
a. an alcohol
b. an aromatic compound
c. an ether
d. a multiple chain cyclic compound

____ 67. Most cellular ATP is produced within the
a. cytoplasm
b. nucleus
c. mitochondria
d. chloroplast

____ 68. Which fat-soluble vitamin is involved in the process of blood clot formation?
a. vitamin K
b. vitamin D
c. vitamin A
d. vitamin E

____ 69. Waxes differ from fats and oils in that
a. the alcohol produced upon hydrolysis is not glycerol
b. they are not easily hydrolyzed
c. more than one response is correct
d. no fatty acids are produced upon hydrolysis

____ 70. Which of the following terms best describes a typical protein?
a. polyester
b. glycoside
c. polypeptide
d. acetal

____ 71. Lactate, prduced in the muscles, is sent to the liver for processing. This is one step of ____.
a. the cori cycle
b. the citric acid cycle
c. glycolysis
d. oxidative phosphorylation

____ 72. The bulk of the energy utilized by marathon runners is provided by
a. fatty acids
b. blood glucose
c. glycogen
d. protein

____ 73. Which of the following statements about carboxylic acids is true?
a. All are weak acids.
b. Produce hydrogen ions in water.
c. Will react with strong bases.
d. All of the choices.

____ 74. Which of the following hormones acts to raise the blood glucose level?
a. epinephrine
b. insulin
c. glucagon
d. more than one response is correct

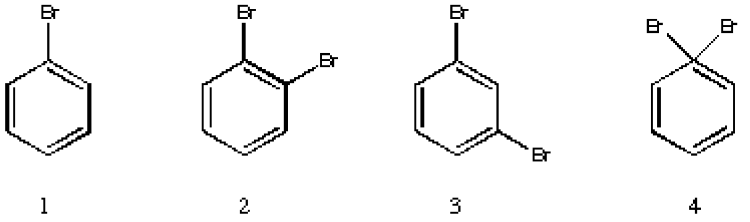
____ 75. To which of the following do amino acids bind during protein synthesis?
a. rRNA
b. tRNA
c. DMA
d. mRNA

____ 76. Which of the following functions is essential in maintaining a constant pH for the blood?
a. respiration reactions associated with breathing
b. kidney activity
c. formation and excretion of perspiration
d. more than one response is correct

____ 77. What units are used for protein, vitamins and minerals on food labels?
a. Reference Daily Intakes (RDI)
b. Daily Reference Values (DRV)
c. Food and Drug Administration (FDA)
d. Food Guide Pyramid (FGP)

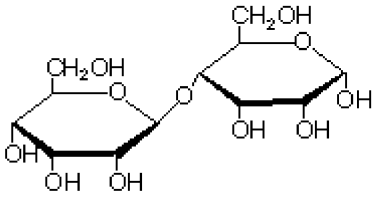
____ 78. Cross links between peptide chains resulting from interactions of the side chains contribute to which type of protein structural feature?
a. tertiary
b. secondary
c. primary
d. more than one response is correct

____ 79. Which of the following compounds is not possible:




a. 1
b. 2
c. 4
d. 3

____ 80. Amino acids of the amino acid pool can be supplied by
a. more than one response is correct
b. the synthesis of nonessential amino acids
c. the breakdown of tissue proteins
d. dietary amino acids

____ 81. The structure 

has what type of glycosidic linkage?
a. $\alpha(1\rightarrow6)$
b. $\alpha(1\rightarrow4)$
c. $\beta(1\rightarrow6)$
d. $\beta(1\rightarrow4)$

____ 82. The vitamin C deficiency disease is
a. pernicious anemia
b. scurvy
c. beriberi
d. pellagra

____ 83. Which of the following nutritional guidelines is now officially endorsed in the United States?
a. Minimum Daily Requirements (MDR)
b. Recommended Dietary Allowances (RDA)
c. more than one response is correct
d. Daily Value (DV)

____ 84. Another acceptable name for 1-ethyl-3-methylbenzene is
a. *o*-ethylmethyltoluene
b. *m*-ethylmethyltoluene
c. *p*-ethylmethyltoluene
d. *m*-ethyltoluene

____ 85. Which of the following is a common function of many vitamins in the body?
a. apoenzymes
b. activators
c. substrates
d. coenzymes

____ 86. Replication of DNA produces two daughter DNA molecules in which
a. each daughter molecule contains both parent strands
b. each daughter molecule contains one parent strand and one newly synthesized strand
c. each daughter molecule contains two newly synthesized strands
d. one daughter molecule contains both parent strands and one daughter molecule contains both newly synthesized strands

____ 87. What is the effect on acetoacetate blood concentration as weeks without food increases?
a. not enough information
b. increases
c. no effect
d. decreases

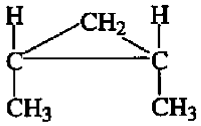
____ 88. Alkanes are ____ in water and ____ than water.
a. insoluble, more dense
b. soluble, more dense
c. insoluble, less dense
d. soluble, less dense

____ 89. What would be the products if ethyl stearate were to undergo hydrolysis?
a. The products would be ethyl stearate hydrate.
b. The products would be ethylaldehyde and stearone.
c. The products would be ethanol and stearic acid.
d. There would be no products as compounds of this nature do not undergo hydrolysis.

____ 90. Reacting a carboxylic acid with a base will produce?
a. an ester
b. a carboxylate salt
c. no reaction
d. an anhydride

____ 91. The amino acid pool is the total cellular supply of
a. dipeptides that yield amino acids
b. more than one response is correct
c. amino acids
d. proteins that yield amino acids

____ 92. Which of the following represents the correct order in the flow of genetic information?
a. mRNA→tRNA→proteins
b. rRNA→mRNA→proteins
c. mRNA→DNA→proteins
d. DNA→mRNA→proteins

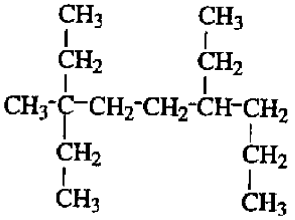


____ 93. The component is ____-1,2-dimethylcyclopropane.
a. cis and trans isomers are not possible
b. neither cis nor trans
c. cis
d. trans

____ 94. Which of the following is not a protein?
a. enzymes
b. antibodies
c. collagen
d. all these substances are proteins

____ 95. An alkaloid present in some cough syrups is
a. methadone
b. morphine
c. codeine
d. cocaine

____ 96. When a carboxylic acid reacts with alcohol, the organic product is
a. an ester
b. a salt
c. an acetal
d. a hemiacetal



____ 97. Give the IUPAC name for the following
a. 2,2,5,6-tetraethylhexane
b. 3,6-diethyl 3-methylnonane
c. 2,2,5-triethyloctane
d. none are correct

____ 98. Which of the following is considered to be a normal constituent of urine?
a. hemoglobin
b. protein
c. amino acids
d. ketone bodies

____ 99. Which buffer system is closely linked to the respiratory system?
a. protein
b. pyruvate
c. bicarbonate
d. phosphate

____ 100. A patient comes in with all the signs of Jaundice. You order a test of the patient's urine. What constituent in the urine would you be looking for at elevated levels?
a. protein
b. ketone bodies
c. glucose
d. bile pigments

# Final Organic Biochem Exam Spring 2010
# Answer Section

## MULTIPLE CHOICE

1. ANS: A PTS: 1
2. ANS: A PTS: 1
3. ANS: B PTS: 1
4. ANS: C PTS: 1
5. ANS: A PTS: 1
6. ANS: B PTS: 1
7. ANS: C PTS: 1
8. ANS: B PTS: 1
9. ANS: B PTS: 1
10. ANS: B PTS: 1
11. ANS: B PTS: 1
12. ANS: B PTS: 1
13. ANS: D PTS: 1
14. ANS: A PTS: 1
15. ANS: C PTS: 1
16. ANS: D PTS: 1
17. ANS: D PTS: 1
18. ANS: D PTS: 1
19. ANS: B PTS: 1
20. ANS: C PTS: 1
21. ANS: B PTS: 1
22. ANS: A PTS: 1
23. ANS: D PTS: 1
24. ANS: D PTS: 1
25. ANS: D PTS: 1
26. ANS: D PTS: 1
27. ANS: C PTS: 1
28. ANS: D PTS: 1
29. ANS: D PTS: 1
30. ANS: B PTS: 1
31. ANS: C PTS: 1
32. ANS: A PTS: 1
33. ANS: C PTS: 1
34. ANS: B PTS: 1
35. ANS: C PTS: 1
36. ANS: C PTS: 1
37. ANS: C PTS: 1
38. ANS: B PTS: 1
39. ANS: A PTS: 1

40. ANS: D PTS: 1
41. ANS: C PTS: 1
42. ANS: B PTS: 1
43. ANS: C PTS: 1
44. ANS: C PTS: 1
45. ANS: C PTS: 1
46. ANS: C PTS: 1
47. ANS: B PTS: 1
48. ANS: C PTS: 1
49. ANS: A PTS: 1
50. ANS: B PTS: 1
51. ANS: A PTS: 1
52. ANS: D PTS: 1
53. ANS: C PTS: 1
54. ANS: C PTS: 1
55. ANS: A PTS: 1
56. ANS: B PTS: 1
57. ANS: A PTS: 1
58. ANS: B PTS: 1
59. ANS: C PTS: 1
60. ANS: C PTS: 1
61. ANS: D PTS: 1
62. ANS: B PTS: 1
63. ANS: C PTS: 1
64. ANS: C PTS: 1
65. ANS: D PTS: 1
66. ANS: A PTS: 1
67. ANS: C PTS: 1
68. ANS: A PTS: 1
69. ANS: C PTS: 1
70. ANS: C PTS: 1
71. ANS: A PTS: 1
72. ANS: C PTS: 1
73. ANS: D PTS: 1
74. ANS: D PTS: 1
75. ANS: B PTS: 1
76. ANS: D PTS: 1
77. ANS: A PTS: 1
78. ANS: A PTS: 1
79. ANS: C PTS: 1
80. ANS: A PTS: 1
81. ANS: D PTS: 1
82. ANS: B PTS: 1
83. ANS: D PTS: 1

84. ANS: D PTS: 1
85. ANS: D PTS: 1
86. ANS: B PTS: 1
87. ANS: B PTS: 1
88. ANS: C PTS: 1
89. ANS: C PTS: 1
90. ANS: B PTS: 1
91. ANS: C PTS: 1
92. ANS: D PTS: 1
93. ANS: C PTS: 1
94. ANS: D PTS: 1
95. ANS: C PTS: 1
96. ANS: A PTS: 1
97. ANS: B PTS: 1
98. ANS: C PTS: 1
99. ANS: C PTS: 1
100. ANS: D PTS: 1

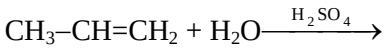
**Name:** _____ **Class:** _____ **Date:** _____ **ID: C**

# Final Organic Biochem Exam Spring 2010

**Multiple Choice**
*Identify the choice that best completes the statement or answers the question.*

____ 1. The pleasant, characteristic odor of fruit flavorings is often associated with the presence of
a. carboxylic acids
b. aldehydes
c. esters
d. carboxylic salts

____ 2. Select the major product that would result from the reaction:



a. $CH_3CH_2CH_2OH$
b. $CH_3CH(OH)CH_3$
c. $CH_3CH_2CH_2SO_4$
d. $CH_3CH_2CH_3$

____ 3. Which reaction is involved in preparing margarine from corn oil?
a. hydrogenation
b. saponification
c. esterification
d. hydrolysis

____ 4. The accumulation of ketone bodies in the blood is termed
a. alkalosis
b. ketonemia
c. acidosis
d. ketonuria

____ 5. A patient comes in with all the signs of Jaundice. You order a test of the patient's urine. What constituent in the urine would you be looking for at elevated levels?
a. glucose
b. bile pigments
c. ketone bodies
d. protein

____ 6. Dehydration of an alcohol will produce?
a. either an alcohol or ether depending on the reaction conditions
b. an ether
c. an alcohol
d. a ketone

____ 7. An alpha amino acid contains
a. an amino group on the carbon next to the carboxylate group
b. two carboxyl groups
c. an amino group on the end carbon
d. two amino groups

____ 8. The theory that proposes a somewhat flexible enzyme conformation is the
   a. physically-fit theory
   b. induced-fit theory
   c. expanding-fit theory
   d. lock-and-key theory

____ 9. What is the group that distinguishes aldehydes from most other classes of compounds?
   a. carboxyl
   b. amide
   c. carbonyl
   d. hydroxy

____ 10. Another acceptable name for 1-ethyl-3-methylbenzene is
   a. *p*-ethylmethyltoluene
   b. *m*-ethyltoluene
   c. *o*-ethylmethyltoluene
   d. *m*-ethylmethyltoluene

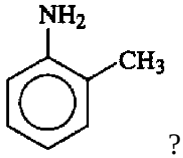
____ 11. A carbohydrate present in the blood is
   a. sucrose
   b. maltose
   c. fructose
   d. glucose

____ 12. An enzyme is operating at its optimum pH. If the pH were increased, how would the rate of the enzyme-catalyzed reaction change?
   a. decrease
   b. could increase or decrease
   c. would not change
   d. increase

____ 13. Which of the following hormones acts to raise the blood glucose level?
   a. more than one response is correct
   b. epinephrine
   c. insulin
   d. glucagon

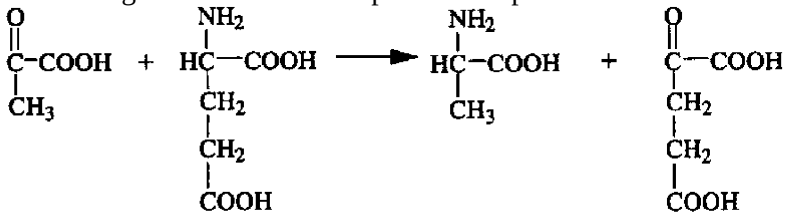
____ 14. To which of the following do amino acids bind during protein synthesis?
   a. tRNA
   b. rRNA
   c. DMA
   d. mRNA

____ 15. Which of the following comprise a nucleic acid backbone?
   a. phosphate and base units
   b. sugar, phosphate and base units
   c. sugar and base units
   d. phosphate and sugar units

____ 16. What is the correct IUPAC name for  ?

a. 1-methyl-2-aniline
b. 1-methylaniline
c. 2-methylaniline
d. N-methylaniline

____ 17. The following reaction is an example of what process?



a. transamination
b. deaminiation
c. decarboxylation
d. aminogenesis

____ 18. Which of the following is a common function of many vitamins in the body?

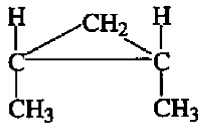
a. apoenzymes
b. coenzymes
c. activators
d. substrates

____ 19. Under aerobic conditions in the body, pyruvate is converted to

a. lactate
b. acetaldehyde
c. acetyl CoA
d. ethanol

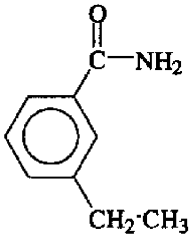
____ 20. Which form of monosaccharides are preferred by human cells?

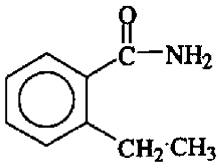
a. L
b. D
c. neither D nor L
d. both D and L

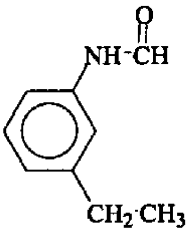
____ 21. The component  is ____-1,2-dimethylcyclopropane.

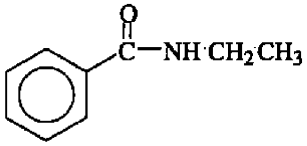
a. cis and trans isomers are not possible
b. neither cis nor trans
c. cis
d. trans

____ 22. The structure of 2-ethylbenzamide is

a. 

b. 

c. 

d. 

____ 23. The amino acid pool is the total cellular supply of
   a. more than one response is correct
   b. amino acids
   c. dipeptides that yield amino acids
   d. proteins that yield amino acids

____ 24. Which nucleic acid is formed during transcription?
   a. rRNA
   b. DNA
   c. tRNA
   d. mRNA

____ 25. Which of the following is correctly called a complex carbohydrate?
   a. sucrose
   b. starch
   c. fructose
   d. lactose

____ 26. A 1 pint donation of blood decreases the body's total blood volume by about
   a. 5% b. 15% c. 10% d. 20%

____ 27. The major difference between normal hemoglobin and that of sickle cell anemia is
   a. sickle cell hemoglobin has one different amino acid in each $\beta$-chain
   b. sickle cell hemoglobin is a much smaller molecule than normal hemoglobin
   c. sickle cell hemoglobin is assembled in a reverse manner
   d. sickle cell hemoglobin is the L isomer and the normal is the D isomer

____ 28. What units are used for protein, vitamins and minerals on food labels?
a. Food and Drug Administration (FDA)
b. Daily Reference Values (DRV)
c. Food Guide Pyramid (FGP)
d. Reference Daily Intakes (RDI)

____ 29. Which of the following terms can be used correctly to fill the blank in the following equation?
apoenzyme + ____ → active enzyme

a. isozyme
b. substrate
c. zymogen
d. cofactor

____ 30. Which of the following is considered to be a normal constituent of urine?
a. protein
b. amino acids
c. ketone bodies
d. hemoglobin

____ 31. Cross links between peptide chains resulting from interactions of the side chains contribute to which type of protein structural feature?
a. primary
b. tertiary
c. secondary
d. more than one response is correct

____ 32. Lactate, prduced in the muscles, is sent to the liver for processing. This is one step of ____.
a. the cori cycle
b. the citric acid cycle
c. oxidative phosphorylation
d. glycolysis

____ 33. Ten amino acids can be synthesized from intermediates of
a. glycolysis and the electron transport chain
b. glycolysis and the citric acid cycle
c. the urea cycle and the electron transport chain
d. the urea cycle and the citric acid cycle

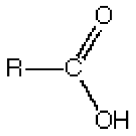
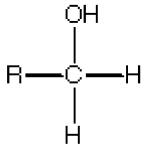
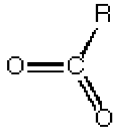
____ 34. Waxes differ from fats and oils in that
a. more than one response is correct
b. they are not easily hydrolyzed
c. the alcohol produced upon hydrolysis is not glycerol
d. no fatty acids are produced upon hydrolysis

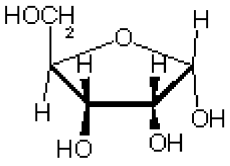
____ 35. The vitamin C deficiency disease is
a. beriberi
b. pellagra
c. pernicious anemia
d. scurvy

____ 36. Which of the following fluids are nearly identical except for protein content?
a. intracellular and interstitial fluid
b. plasma and interstitial fluid
c. plasma and intracellular fluid
d. extracellular and intracellular

____ 37. Which of the following products is formed when hydrogen is reacted with 3-methyl-2-butanone?
a. a secondary alcohol
b. a primary alcohol
c. a tertiary alcohol
d. an acetal

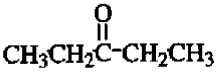
____ 38. A positive Benedict's test is indicated by the formation of:
a. $Cu^{2+}$
b. a metallic mirror
c. Cu
d. $Cu_2O$

____ 39. Which of the following is NOT a functional group associated with organic molecules?
a. 
b. 
c. 
d. All of them are functional groups

____ 40. The struture  is shown in what anomeric form?
a. β
b. trans
c. cis
d. α

____ 41. Which of the following compounds exhibits structural isomerism?
a. propane
b. butane
c. ethane
d. methane

____ 42. Which of the following is a characteristic of a lipid?
a. Most lipids are waxy.
b. Most lipids are soluble in water.
c. Most lipids are high density compounds.
d. Lipids are found only animals.

____ 43. Which of the following compounds would you expect to be foul smelling?
a. 
b. $CH_3CH_2CH_2SH$
c. $CH_3CH_2CH_2OH$
d. $CH_3CH_2CH_2CH_3$

____ 44. Heavy metal ions are believed to act as ____ inhibitors.
a. irreversible
b. reversible
c. noncompetitive
d. competitive

____ 45. The main source of energy for the brain is
a. glycogen
b. glucose
c. glycerol
d. fatty acids

____ 46. The synthesis of fatty acids
a. more than one response is correct
b. takes place by different reactions than the reverse of the fatty acid spiral and in a different cellular location.
c. takes place by simply the reverse reactions of the fatty acid spiral
d. takes place in the same location within a cell as the fatty acid spiral

____ 47. What is a risk(s) of a vegetarian diet?
a. hypertension
b. more than one response is correct
c. deficient in vitamins
d. low intake of essential amino acids

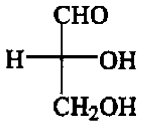
____ 48. Amino acids that are degraded into ____ are termed glucogenic amino acids.
a. pyruvate
b. acetoacetyl CoA
c. aspartate
d. acetyl CoA

____ 49. What is a major difference between inorganic and organic compounds?
a. There are many more inorganic compounds than organic compounds.
b. Organic compounds contain carbon; few inorganic compounds do.
c. Organic compounds tend to be more polar than inorganic compounds
d. Organic compounds are never ionic.

____ 50. The bulk of the energy utilized by marathon runners is provided by
a. blood glucose
b. glycogen
c. protein
d. fatty acids

____ 51. The most important function of amino acids (in terms of amount used) is for the synthesis of
a. pyruvate for energy production
b. glucose
c. body proteins
d. purines and pyrimidines

____ 52. A key organ in regulating blood glucose levels is the
a. adrenal cortex
b. heart
c. liver
d. thyroid




____ 53. The structure is shown in
a. neither D nor L
b. an L form
c. a D form
d. both D and L

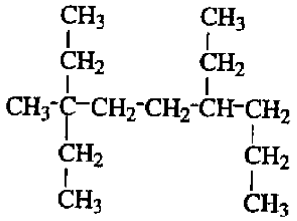
____ 54. Which of the following hormones acts to lower the blood glucose level?
a. insulin
b. epinephrine
c. more than one response is correct
d. glucagon

____ 55. Alkanes are ____ in water and ____ than water.
a. insoluble, more dense
b. insoluble, less dense
c. soluble, less dense
d. soluble, more dense

____ 56. Which of the following are important contributions made by dietary lipids?
a. help carry fat-soluble vitamins through the body
b. provide essential fatty acids
c. more than one response is correct
d. good energy sources

____ 57. When a carboxylic acid reacts with alcohol, the organic product is
a. an ester
b. an acetal
c. a salt
d. a hemiacetal

____ 58. Calcium is a mineral that is required by humans for
a. blood buffer system
b. blood production
c. bone and teeth formation
d. there is more than one correct response



____ 59. Give the IUPAC name for the following
a. 2,2,5,6-tetraethylhexane
b. 3,6-diethyl 3-methylnonane
c. 2,2,5-triethyloctane
d. none are correct

____ 60. Which of the following is not an energy source used in metabolism?
a. UTC
b. ATP
c. UTP
d. GTP

____ 61. Which of the following statements about carboxylic acids is true?
a. All are weak acids.
b. Will react with strong bases.
c. Produce hydrogen ions in water.
d. All of the choices.

____ 62. Some amine drugs are administered in the form of salts in order to
a. make them more basic
b. make them taste better
c. make them form into pills more easily
d. make them more soluble in body fluids

____ 63. Which fat-soluble vitamin is involved in the process of blood clot formation?
a. vitamin D
b. vitamin K
c. vitamin A
d. vitamin E

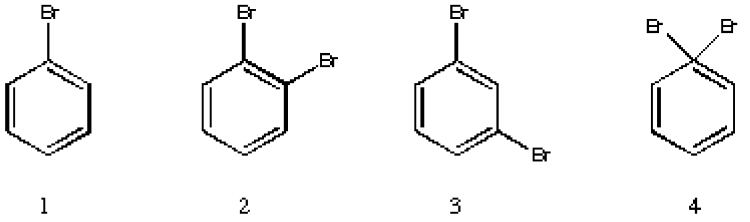
____ 64. Hyperventilation occurs when too much carbon dioxide is exhaled. According to Le Châtelier's principle which way will the equilibrium shift to restore the lost $CO_2$?

$$H_2CO_3 \rightleftharpoons H_2O + CO_2$$

a. no effect
b. need more information
c. left
d. right

____ 65. The body loses water through the
a. skin
b. lungs
c. kidneys
d. more than one response is correct

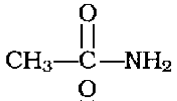
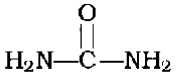
____ 66. Which of the following compounds is not possible:




1 2 3 4

a. 2
b. 4
c. 3
d. 1

____ 67. The nitrogen-containing product of the urea cycle is

a. $NH_4^+$
b. $CH_3CH_3$
c. 
d. 

____ 68. Reacting a carboxylic acid with a base will produce?

a. no reaction
b. a carboxylate salt
c. an ester
d. an anhydride

____ 69. Steroids are classified as lipids because they have this distinguishing feature: they

a. can be saponified
b. have a ring structure
c. dissolve in nonpolar solvents
d. are present in biological materials

____ 70. Which buffer system is closely linked to the respiratory system?

a. pyruvate
b. phosphate
c. protein
d. bicarbonate

____ 71. Most cellular ATP is produced within the

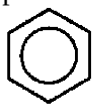
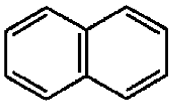
a. mitochondria
b. cytoplasm
c. chloroplast
d. nucleus

____ 72. What is the effect on acetoacetate blood concentration as weeks without food increases?

a. not enough information
b. increases
c. decreases
d. no effect

____ 73. What would be the products if ethyl stearate were to undergo hydrolysis?
a. The products would be ethyl stearate hydrate.
b. The products would be ethylaldehyde and stearone.
c. The products would be ethanol and stearic acid.
d. There would be no products as compounds of this nature do not undergo hydrolysis.

____ 74. Which of the following vitamins can a person overdose if taken in high levels?
a. folic acid
b. vitamin C
c. vitamin B12
d. vitamin E

____ 75. Which of the following compounds is not considered to be aromatic?
a.  b.  c.  d. 

____ 76. Which of the following is the substance that causes the symptoms associated wth a 'hangover'?
a. benzaldehyde
b. methanal
c. ethanal
d. 2-octanone

____ 77. Which of the following alcohols would be the most difficult to oxidize?
a. $HOCH_2CH_2OH$
b. $CH_2CH(OH)CH_2(CH_3)_2$
c. $CH_2C(OH)(CH_3)_2$
d. $CH_3OH$

____ 78. Which of the following represents the correct order in the flow of genetic information?
a. mRNA→tRNA→proteins
b. DNA→mRNA→proteins
c. rRNA→mRNA→proteins
d. mRNA→DNA→proteins

____ 79. Upon hydrolysis, which of the following lipids would yield a carbohydrate as a product?
a. cephalins
b. lecithins
c. phosphoglycerides
d. glycolipids

____ 80. Blood has an approximate pH of
a. 7.4 b. 6.4 c. 7.0 d. 8.0

____ 81. How many three-letter combinations are present in the genetic code?
a. 64 b. 16 c. 88 d. 32

____ 82. Which of the following is a product of glycolysis?
a. pyruvate
b. acetyl CoA
c. lactase
d. $CO_2 + H_2O$

____ 83. Which of the following occurs in the citric acid cycle?
a. 'pumping' of hydrogen ions
b. generation of ATP
c. oxidation of carbon
d. more than one answer is correct

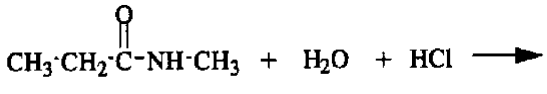
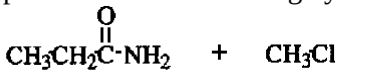
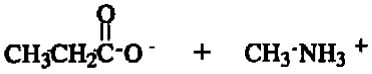
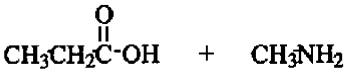
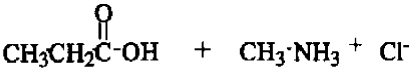
____ 84. Which of the following nutritional guidelines is now officially endorsed in the United States?
a. Daily Value (DV)
b. Recommended Dietary Allowances (RDA)
c. more than one response is correct
d. Minimum Daily Requirements (MDR)

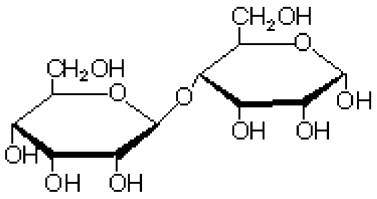
____ 85. Excessive vomiting can lead to a condition of
a. metabolic alkalosis
b. respiratory alkalosis
c. metabolic acidosis
d. respiratory acidosis

____ 86. To which class of compounds does cholesterol belong?
a. a multiple chain cyclic compound
b. an ether
c. an alcohol
d. an aromatic compound

____ 87. The molecular basis of a mutation is most closely linked to a
a. misplaced stop codon
b. defect in the transcription of a genetic message to mRNA
c. defect in the rRNA of ribosomes
d. change in the sequence of bases on a DNA molecule

____ 88. Which of the following is not a protein?
a. collagen
b. antibodies
c. enzymes
d. all these substances are proteins

____ 89. The products of the following hydrolysis are 
a. 
b. 
c. 
d. 

____ 90. The structure  has what type of glycosidic linkage?

   a. $\alpha(1\rightarrow6)$
   b. $\alpha(1\rightarrow4)$
   c. $\beta(1\rightarrow4)$
   d. $\beta(1\rightarrow6)$

____ 91. Amino acids of the amino acid pool can be supplied by
   a. the synthesis of nonessential amino acids
   b. the breakdown of tissue proteins
   c. dietary amino acids
   d. more than one response is correct

____ 92. What is the major difference between a cyclic hemiacetal and a cyclic acetal?
   a. The cyclic hemiacetal is an alcohol, whereas the cyclic acetal is an ether.
   b. The cyclic hemiacetal contains more carbons in the ring than the cyclic acetal.
   c. The cyclic hemiacetal is an acid, and the cyclic acetal is a base.
   d. All of the responses are correct.

____ 93. Movement of a ribosome along a mRNA is termed
   a. lateration
   b. translation
   c. elongation
   d. translocation

____ 94. Codons provide the information needed to synthesize:
   a. proteins
   b. mRNA
   c. DNA
   d. tRNA

____ 95. Which compound would be the most soluble in water?
   a. $CH_3–O–CH_2–CH_2–CH_3$
   b. $CH_3–CH_2–O–CH_2–CH_3$
   c. $CH_3–CH_2–CH_2–CH_2–CH_3$
   d. $CH_3–CH_2–CH_2–CH_2–OH$

____ 96. Replication of DNA produces two daughter DNA molecules in which
   a. each daughter molecule contains both parent strands
   b. each daughter molecule contains one parent strand and one newly synthesized strand
   c. each daughter molecule contains two newly synthesized strands
   d. one daughter molecule contains both parent strands and one daughter molecule contains both newly synthesized strands

____ 97. Viruses infect cells by
   a. immediate destruction of cells
   b. embedding in cell membranes
   c. injecting their nucleic acid into cells
   d. withdrawing cellular contents

____ 98. An alkaloid present in some cough syrups is
a. morphine
b. codeine
c. cocaine
d. methadone

____ 99. Which of the following functions is essential in maintaining a constant pH for the blood?
a. formation and excretion of perspiration
b. respiration reactions associated with breathing
c. kidney activity
d. more than one response is correct

____ 100. Which of the following terms best describes a typical protein?
a. glycoside
b. polyester
c. polypeptide
d. acetal

# Final Organic Biochem Exam Spring 2010
# Answer Section

## MULTIPLE CHOICE

1. ANS: C PTS: 1
2. ANS: B PTS: 1
3. ANS: A PTS: 1
4. ANS: B PTS: 1
5. ANS: B PTS: 1
6. ANS: A PTS: 1
7. ANS: A PTS: 1
8. ANS: B PTS: 1
9. ANS: C PTS: 1
10. ANS: B PTS: 1
11. ANS: D PTS: 1
12. ANS: A PTS: 1
13. ANS: A PTS: 1
14. ANS: A PTS: 1
15. ANS: D PTS: 1
16. ANS: C PTS: 1
17. ANS: A PTS: 1
18. ANS: B PTS: 1
19. ANS: C PTS: 1
20. ANS: B PTS: 1
21. ANS: C PTS: 1
22. ANS: B PTS: 1
23. ANS: B PTS: 1
24. ANS: D PTS: 1
25. ANS: B PTS: 1
26. ANS: C PTS: 1
27. ANS: A PTS: 1
28. ANS: D PTS: 1
29. ANS: D PTS: 1
30. ANS: B PTS: 1
31. ANS: B PTS: 1
32. ANS: A PTS: 1
33. ANS: B PTS: 1
34. ANS: A PTS: 1
35. ANS: D PTS: 1
36. ANS: B PTS: 1
37. ANS: A PTS: 1
38. ANS: D PTS: 1
39. ANS: C PTS: 1

40. ANS: D PTS: 1
41. ANS: B PTS: 1
42. ANS: A PTS: 1
43. ANS: B PTS: 1
44. ANS: A PTS: 1
45. ANS: B PTS: 1
46. ANS: B PTS: 1
47. ANS: B PTS: 1
48. ANS: A PTS: 1
49. ANS: B PTS: 1
50. ANS: B PTS: 1
51. ANS: C PTS: 1
52. ANS: C PTS: 1
53. ANS: C PTS: 1
54. ANS: A PTS: 1
55. ANS: B PTS: 1
56. ANS: C PTS: 1
57. ANS: A PTS: 1
58. ANS: C PTS: 1
59. ANS: B PTS: 1
60. ANS: A PTS: 1
61. ANS: D PTS: 1
62. ANS: D PTS: 1
63. ANS: B PTS: 1
64. ANS: D PTS: 1
65. ANS: D PTS: 1
66. ANS: B PTS: 1
67. ANS: D PTS: 1
68. ANS: B PTS: 1
69. ANS: C PTS: 1
70. ANS: D PTS: 1
71. ANS: A PTS: 1
72. ANS: B PTS: 1
73. ANS: C PTS: 1
74. ANS: D PTS: 1
75. ANS: C PTS: 1
76. ANS: C PTS: 1
77. ANS: C PTS: 1
78. ANS: B PTS: 1
79. ANS: D PTS: 1
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82. ANS: A PTS: 1
83. ANS: C PTS: 1

84. ANS: A PTS: 1
85. ANS: A PTS: 1
86. ANS: C PTS: 1
87. ANS: D PTS: 1
88. ANS: D PTS: 1
89. ANS: D PTS: 1
90. ANS: C PTS: 1
91. ANS: D PTS: 1
92. ANS: A PTS: 1
93. ANS: D PTS: 1
94. ANS: A PTS: 1
95. ANS: D PTS: 1
96. ANS: B PTS: 1
97. ANS: C PTS: 1
98. ANS: B PTS: 1
99. ANS: D PTS: 1
100. ANS: C PTS: 1

**Name:** _____ **Class:** _____ **Date:** _____ **ID: D**

# Final Organic Biochem Exam Spring 2010

**Multiple Choice**
*Identify the choice that best completes the statement or answers the question.*

____ 1. Which form of monosaccharides are preferred by human cells?
a. D
b. both D and L
c. neither D nor L
d. L

____ 2. The major difference between normal hemoglobin and that of sickle cell anemia is
a. sickle cell hemoglobin has one different amino acid in each $\beta$-chain
b. sickle cell hemoglobin is the L isomer and the normal is the D isomer
c. sickle cell hemoglobin is assembled in a reverse manner
d. sickle cell hemoglobin is a much smaller molecule than normal hemoglobin

____ 3. Movement of a ribosome along a mRNA is termed
a. lateration
b. translocation
c. elongation
d. translation

____ 4. Which fat-soluble vitamin is involved in the process of blood clot formation?
a. vitamin K
b. vitamin E
c. vitamin D
d. vitamin A

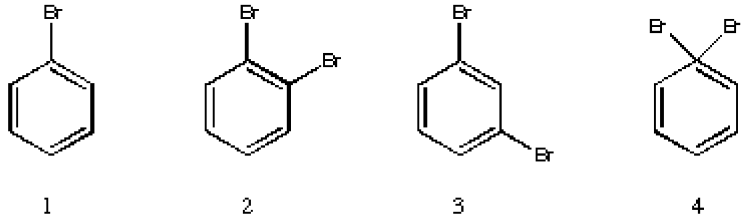
____ 5. An alpha amino acid contains
a. an amino group on the carbon next to the carboxylate group
b. an amino group on the end carbon
c. two carboxyl groups
d. two amino groups

____ 6. Which of the following comprise a nucleic acid backbone?
a. sugar and base units
b. phosphate and base units
c. phosphate and sugar units
d. sugar, phosphate and base units

____ 7. Which nucleic acid is formed during transcription?
a. rRNA
b. DNA
c. mRNA
d. tRNA

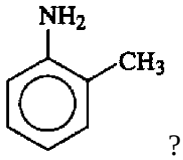
____ 8. Which of the following functions is essential in maintaining a constant pH for the blood?
a. formation and excretion of perspiration
b. kidney activity
c. more than one response is correct
d. respiration reactions associated with breathing

____ 9. Which of the following compounds is not possible:




1 2 3 4

a. 1
b. 2
c. 3
d. 4

____ 10. What is the correct IUPAC name for  ?

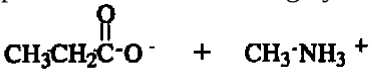

a. 1-methylaniline
b. N-methylaniline
c. 2-methylaniline
d. 1-methyl-2-aniline

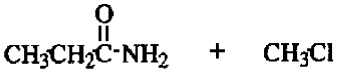
____ 11. What is a major difference between inorganic and organic compounds?
a. Organic compounds are never ionic.
b. Organic compounds tend to be more polar than inorganic compounds
c. There are many more inorganic compounds than organic compounds.
d. Organic compounds contain carbon; few inorganic compounds do.

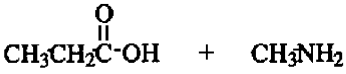
____ 12. The bulk of the energy utilized by marathon runners is provided by
a. fatty acids
b. protein
c. glycogen
d. blood glucose

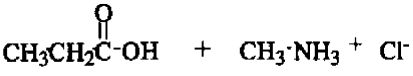
____ 13. Which of the following compounds exhibits structural isomerism?
a. propane
b. methane
c. ethane
d. butane

____ 14. The products of the following hydrolysis are 


a. 


b. 


c. 


d. 

____ 15. Which of the following is a characteristic of a lipid?
a. Most lipids are high density compounds.
b. Most lipids are waxy.
c. Lipids are found only animals.
d. Most lipids are soluble in water.

____ 16. Viruses infect cells by
a. embedding in cell membranes
b. immediate destruction of cells
c. injecting their nucleic acid into cells
d. withdrawing cellular contents

____ 17. The synthesis of fatty acids
a. takes place in the same location within a cell as the fatty acid spiral
b. more than one response is correct
c. takes place by different reactions than the reverse of the fatty acid spiral and in a different cellular location.
d. takes place by simply the reverse reactions of the fatty acid spiral

____ 18. How many three-letter combinations are present in the genetic code?
a. 16 b. 64 c. 32 d. 88

____ 19. A carbohydrate present in the blood is
a. sucrose
b. glucose
c. maltose
d. fructose

____ 20. Which of the following statements about carboxylic acids is true?
a. All are weak acids.
b. Produce hydrogen ions in water.
c. Will react with strong bases.
d. All of the choices.

____ 21. Which buffer system is closely linked to the respiratory system?
a. bicarbonate
b. pyruvate
c. protein
d. phosphate

____ 22. The main source of energy for the brain is
a. glycogen
b. fatty acids
c. glucose
d. glycerol

____ 23. The molecular basis of a mutation is most closely linked to a
a. change in the sequence of bases on a DNA molecule
b. defect in the transcription of a genetic message to mRNA
c. misplaced stop codon
d. defect in the rRNA of ribosomes

____ 24. Amino acids that are degraded into ____ are termed glucogenic amino acids.
a. aspartate
b. acetyl CoA
c. pyruvate
d. acetoacetyl CoA

____ 25. When a carboxylic acid reacts with alcohol, the organic product is
a. a hemiacetal
b. a salt
c. an acetal
d. an ester

____ 26. What would be the products if ethyl stearate were to undergo hydrolysis?
a. The products would be ethylaldehyde and stearone.
b. The products would be ethanol and stearic acid.
c. There would be no products as compounds of this nature do not undergo hydrolysis.
d. The products would be ethyl stearate hydrate.

____ 27. A patient comes in with all the signs of Jaundice. You order a test of the patient's urine. What constituent in the urine would you be looking for at elevated levels?
a. bile pigments
b. ketone bodies
c. glucose
d. protein

____ 28. A key organ in regulating blood glucose levels is the
a. adrenal cortex
b. thyroid
c. liver
d. heart

____ 29. Ten amino acids can be synthesized from intermediates of
a. glycolysis and the citric acid cycle
b. glycolysis and the electron transport chain
c. the urea cycle and the citric acid cycle
d. the urea cycle and the electron transport chain

____ 30. Waxes differ from fats and oils in that
a. more than one response is correct
b. no fatty acids are produced upon hydrolysis
c. they are not easily hydrolyzed
d. the alcohol produced upon hydrolysis is not glycerol

____ 31. Which of the following are important contributions made by dietary lipids?
a. provide essential fatty acids
b. help carry fat-soluble vitamins through the body
c. more than one response is correct
d. good energy sources

____ 32. Heavy metal ions are believed to act as ____ inhibitors.
a. competitive
b. reversible
c. irreversible
d. noncompetitive

____ 33. The theory that proposes a somewhat flexible enzyme conformation is the
a. expanding-fit theory
b. lock-and-key theory
c. physically-fit theory
d. induced-fit theory

____ 34. Which of the following is a product of glycolysis?
a. $CO_2 + H_2O$
b. lactase
c. pyruvate
d. acetyl CoA

____ 35. Which of the following fluids are nearly identical except for protein content?
a. extracellular and intracellular
b. plasma and intracellular fluid
c. plasma and interstitial fluid
d. intracellular and interstitial fluid

____ 36. What is the effect on acetoacetate blood concentration as weeks without food increases?
a. decreases
b. increases
c. not enough information
d. no effect

____ 37. Steroids are classified as lipids because they have this distinguishing feature: they
a. can be saponified
b. dissolve in nonpolar solvents
c. are present in biological materials
d. have a ring structure

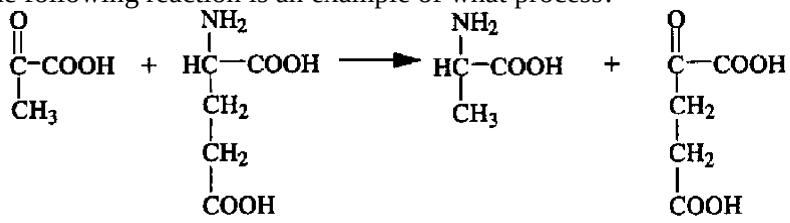
____ 38. Lactate, prduced in the muscles, is sent to the liver for processing. This is one step of ____.
a. the cori cycle
b. oxidative phosphorylation
c. glycolysis
d. the citric acid cycle

____ 39. To which of the following do amino acids bind during protein synthesis?
a. DMA
b. rRNA
c. tRNA
d. mRNA

____ 40. Amino acids of the amino acid pool can be supplied by
a. more than one response is correct
b. the synthesis of nonessential amino acids
c. dietary amino acids
d. the breakdown of tissue proteins

____ 41. Codons provide the information needed to synthesize:
a. tRNA
b. DNA
c. mRNA
d. proteins

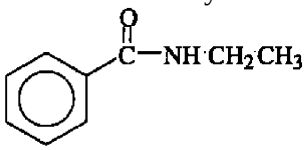
____ 42. The following reaction is an example of what process?

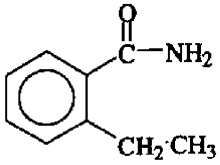


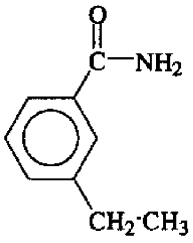
a. decarboxylation
b. transamination
c. aminogenesis
d. deaminiation

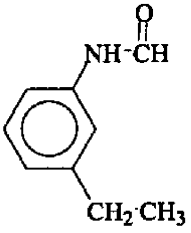
____ 43. Which of the following is the substance that causes the symptoms associated wth a 'hangover'?
a. ethanal
b. benzaldehyde
c. methanal
d. 2-octanone

____ 44. The structure of 2-ethylbenzamide is

a. 

b. 

c. 

d. 

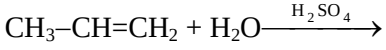
____ 45. Which of the following is not a protein?
a. antibodies
b. enzymes
c. collagen
d. all these substances are proteins

____ 46. To which class of compounds does cholesterol belong?
a. an alcohol
b. an aromatic compound
c. an ether
d. a multiple chain cyclic compound

____ 47. Which reaction is involved in preparing margarine from corn oil?
a. hydrolysis
b. hydrogenation
c. esterification
d. saponification

____ 48. Excessive vomiting can lead to a condition of
a. respiratory acidosis
b. respiratory alkalosis
c. metabolic acidosis
d. metabolic alkalosis

____ 49. Select the major product that would result from the reaction:



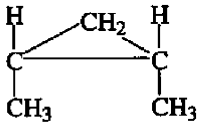
a. $CH_3CH(OH)CH_3$
b. $CH_3CH_2CH_2OH$
c. $CH_3CH_2CH_3$
d. $CH_3CH_2CH_2SO_4$

____ 50. What units are used for protein, vitamins and minerals on food labels?
a. Daily Reference Values (DRV)
b. Reference Daily Intakes (RDI)
c. Food and Drug Administration (FDA)
d. Food Guide Pyramid (FGP)

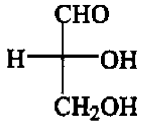
____ 51. Under aerobic conditions in the body, pyruvate is converted to
a. lactate
b. acetyl CoA
c. ethanol
d. acetaldehyde

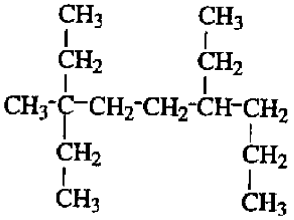
____ 52. Upon hydrolysis, which of the following lipids would yield a carbohydrate as a product?
a. phosphoglycerides
b. lecithins
c. cephalins
d. glycolipids

____ 53. The body loses water through the
a. kidneys
b. more than one response is correct
c. lungs
d. skin

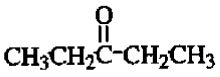
____ 54. The component  is ____-1,2-dimethylcyclopropane.
   a. neither cis nor trans
   b. cis
   c. trans
   d. cis and trans isomers are not possible

____ 55. Reacting a carboxylic acid with a base will produce?
   a. an anhydride
   b. no reaction
   c. a carboxylate salt
   d. an ester

____ 56. The structure  is shown in
   a. an L form
   b. neither D nor L
   c. both D and L
   d. a D form

____ 57. Give the IUPAC name for the following 
   a. 3,6-diethyl 3-methylnonane
   b. 2,2,5,6-tetraethylhexane
   c. 2,2,5-triethyloctane
   d. none are correct

____ 58. Which of the following hormones acts to raise the blood glucose level?
   a. insulin
   b. glucagon
   c. epinephrine
   d. more than one response is correct

____ 59. Which of the following compounds would you expect to be foul smelling?
   a. $CH_3CH_2CH_2SH$
   b. $CH_3CH_2CH_2OH$
   c. 
   d. $CH_3CH_2CH_2CH_3$

____ 60. The vitamin C deficiency disease is
   a. scurvy
   b. beriberi
   c. pellagra
   d. pernicious anemia

____ 61. Which of the following products is formed when hydrogen is reacted with 3-methyl-2-butanone?
a. a primary alcohol
b. a secondary alcohol
c. an acetal
d. a tertiary alcohol

____ 62. Which of the following is a common function of many vitamins in the body?
a. substrates
b. activators
c. coenzymes
d. apoenzymes

____ 63. What is a risk(s) of a vegetarian diet?
a. hypertension
b. more than one response is correct
c. deficient in vitamins
d. low intake of essential amino acids

____ 64. Calcium is a mineral that is required by humans for
a. blood buffer system
b. bone and teeth formation
c. there is more than one correct response
d. blood production

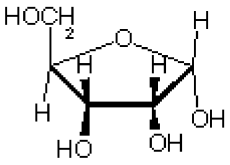
____ 65. Which of the following represents the correct order in the flow of genetic information?
a. mRNA→DNA→proteins
b. rRNA→mRNA→proteins
c. mRNA→tRNA→proteins
d. DNA→mRNA→proteins

____ 66. Which of the following alcohols would be the most difficult to oxidize?
a. $CH_2C(OH)(CH_3)_2$
b. $HOCH_2CH_2OH$
c. $CH_3OH$
d. $CH_2CH(OH)CH_2(CH_3)_2$

____ 67. Which of the following terms can be used correctly to fill the blank in the following equation?
apoenzyme + ____ → active enzyme

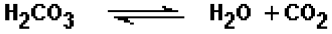
a. isozyme
b. zymogen
c. cofactor
d. substrate

____ 68. Which of the following is correctly called a complex carbohydrate?
a. sucrose
b. lactose
c. starch
d. fructose




____ 69. The struture is shown in what anomeric form?
- a. trans
- b. cis
- c. β
- d. α

____ 70. Hyperventilation occurs when too much carbon dioxide is exhaled. According to Le Châtelier's principle which way will the equilibrium shift to restore the lost $CO_2$?



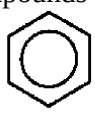
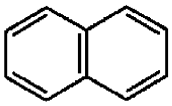

- a. right
- b. left
- c. need more information
- d. no effect

____ 71. Which of the following is not an energy source used in metabolism?
- a. ATP
- b. GTP
- c. UTC
- d. UTP

____ 72. An enzyme is operating at its optimum pH. If the pH were increased, how would the rate of the enzyme-catalyzed reaction change?
- a. could increase or decrease
- b. decrease
- c. would not change
- d. increase

____ 73. Which of the following hormones acts to lower the blood glucose level?
- a. more than one response is correct
- b. glucagon
- c. epinephrine
- d. insulin

____ 74. Which of the following compounds is not considered to be aromatic?

a.  b.  c.  d. 

____ 75. Which compound would be the most soluble in water?
- a. $CH_3–O–CH_2–CH_2–CH_3$
- b. $CH_3–CH_2–CH_2–CH_2–CH_3$
- c. $CH_3–CH_2–CH_2–CH_2–OH$
- d. $CH_3–CH_2–O–CH_2–CH_3$

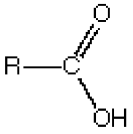
____ 76. Replication of DNA produces two daughter DNA molecules in which
a. one daughter molecule contains both parent strands and one daughter molecule contains both newly synthesized strands
b. each daughter molecule contains two newly synthesized strands
c. each daughter molecule contains one parent strand and one newly synthesized strand
d. each daughter molecule contains both parent strands

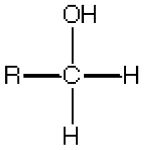
____ 77. Which of the following vitamins can a person overdose if taken in high levels?
a. vitamin C
b. folic acid
c. vitamin E
d. vitamin B12

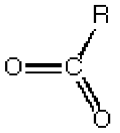
____ 78. The pleasant, characteristic odor of fruit flavorings is often associated with the presence of
a. esters
b. aldehydes
c. carboxylic salts
d. carboxylic acids

____ 79. Which of the following is considered to be a normal constituent of urine?
a. protein
b. hemoglobin
c. ketone bodies
d. amino acids

____ 80. The accumulation of ketone bodies in the blood is termed
a. alkalosis
b. ketonuria
c. acidosis
d. ketonemia

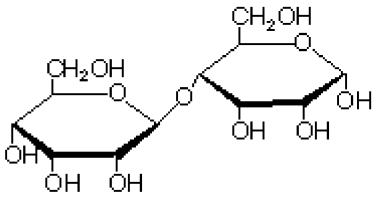
____ 81. Which of the following is NOT a functional group associated with organic molecules?
a. 

b. 

c. 

d. All of them are functional groups

____ 82. An alkaloid present in some cough syrups is
a. morphine
b. codeine
c. methadone
d. cocaine

____ 83. The structure  has what type of glycosidic linkage?

a. $\alpha(1\rightarrow4)$
b. $\alpha(1\rightarrow6)$
c. $\beta(1\rightarrow4)$
d. $\beta(1\rightarrow6)$

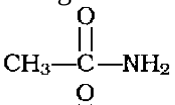
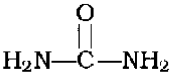
____ 84. A positive Benedict's test is indicated by the formation of:
a. a metallic mirror
b. $Cu_2O$
c. Cu
d. $Cu^{2+}$

____ 85. The most important function of amino acids (in terms of amount used) is for the synthesis of
a. pyruvate for energy production
b. purines and pyrimidines
c. glucose
d. body proteins

____ 86. Which of the following occurs in the citric acid cycle?
a. 'pumping' of hydrogen ions
b. more than one answer is correct
c. oxidation of carbon
d. generation of ATP

____ 87. Which of the following nutritional guidelines is now officially endorsed in the United States?
a. Minimum Daily Requirements (MDR)
b. Daily Value (DV)
c. Recommended Dietary Allowances (RDA)
d. more than one response is correct

____ 88. Another acceptable name for 1-ethyl-3-methylbenzene is
a. *p*-ethylmethyltoluene
b. *m*-ethylmethyltoluene
c. *m*-ethyltoluene
d. *o*-ethylmethyltoluene

____ 89. The nitrogen-containing product of the urea cycle is
a. 
b. 
c. $CH_3CH_3$
d. $NH_4^+$

____ 90. Blood has an approximate pH of
a. 7.4 b. 8.0 c. 6.4 d. 7.0

____ 91. Alkanes are ____ in water and ____ than water.
a. soluble, less dense
b. soluble, more dense
c. insoluble, more dense
d. insoluble, less dense

____ 92. A 1 pint donation of blood decreases the body's total blood volume by about
a. 5% b. 10% c. 15% d. 20%

____ 93. The amino acid pool is the total cellular supply of
a. amino acids
b. dipeptides that yield amino acids
c. more than one response is correct
d. proteins that yield amino acids

____ 94. Dehydration of an alcohol will produce?
a. either an alcohol or ether depending on the reaction conditions
b. an ether
c. an alcohol
d. a ketone

____ 95. Some amine drugs are administered in the form of salts in order to
a. make them taste better
b. make them more basic
c. make them form into pills more easily
d. make them more soluble in body fluids

____ 96. Which of the following terms best describes a typical protein?
a. glycoside
b. polyester
c. acetal
d. polypeptide

____ 97. Most cellular ATP is produced within the
a. cytoplasm
b. mitochondria
c. chloroplast
d. nucleus

____ 98. What is the group that distinguishes aldehydes from most other classes of compounds?
a. carboxyl
b. hydroxy
c. amide
d. carbonyl

____ 99. Cross links between peptide chains resulting from interactions of the side chains contribute to which type of protein structural feature?
a. secondary
b. primary
c. tertiary
d. more than one response is correct

____ 100. What is the major difference between a cyclic hemiacetal and a cyclic acetal?
a. The cyclic hemiacetal contains more carbons in the ring than the cyclic acetal.
b. The cyclic hemiacetal is an alcohol, whereas the cyclic acetal is an ether.
c. The cyclic hemiacetal is an acid, and the cyclic acetal is a base.
d. All of the responses are correct.

# Final Organic Biochem Exam Spring 2010
# Answer Section

## MULTIPLE CHOICE

1. ANS: A PTS: 1
2. ANS: A PTS: 1
3. ANS: B PTS: 1
4. ANS: A PTS: 1
5. ANS: A PTS: 1
6. ANS: C PTS: 1
7. ANS: C PTS: 1
8. ANS: C PTS: 1
9. ANS: D PTS: 1
10. ANS: C PTS: 1
11. ANS: D PTS: 1
12. ANS: C PTS: 1
13. ANS: D PTS: 1
14. ANS: D PTS: 1
15. ANS: B PTS: 1
16. ANS: C PTS: 1
17. ANS: C PTS: 1
18. ANS: B PTS: 1
19. ANS: B PTS: 1
20. ANS: D PTS: 1
21. ANS: A PTS: 1
22. ANS: C PTS: 1
23. ANS: A PTS: 1
24. ANS: C PTS: 1
25. ANS: D PTS: 1
26. ANS: B PTS: 1
27. ANS: A PTS: 1
28. ANS: C PTS: 1
29. ANS: A PTS: 1
30. ANS: A PTS: 1
31. ANS: C PTS: 1
32. ANS: C PTS: 1
33. ANS: D PTS: 1
34. ANS: C PTS: 1
35. ANS: C PTS: 1
36. ANS: B PTS: 1
37. ANS: B PTS: 1
38. ANS: A PTS: 1
39. ANS: C PTS: 1

40. ANS: A PTS: 1
41. ANS: D PTS: 1
42. ANS: B PTS: 1
43. ANS: A PTS: 1
44. ANS: B PTS: 1
45. ANS: D PTS: 1
46. ANS: A PTS: 1
47. ANS: B PTS: 1
48. ANS: D PTS: 1
49. ANS: A PTS: 1
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52. ANS: D PTS: 1
53. ANS: B PTS: 1
54. ANS: B PTS: 1
55. ANS: C PTS: 1
56. ANS: D PTS: 1
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58. ANS: D PTS: 1
59. ANS: A PTS: 1
60. ANS: A PTS: 1
61. ANS: B PTS: 1
62. ANS: C PTS: 1
63. ANS: B PTS: 1
64. ANS: B PTS: 1
65. ANS: D PTS: 1
66. ANS: A PTS: 1
67. ANS: C PTS: 1
68. ANS: C PTS: 1
69. ANS: D PTS: 1
70. ANS: A PTS: 1
71. ANS: C PTS: 1
72. ANS: B PTS: 1
73. ANS: D PTS: 1
74. ANS: D PTS: 1
75. ANS: C PTS: 1
76. ANS: C PTS: 1
77. ANS: C PTS: 1
78. ANS: A PTS: 1
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83. ANS: C PTS: 1

84. ANS: B PTS: 1
85. ANS: D PTS: 1
86. ANS: C PTS: 1
87. ANS: B PTS: 1
88. ANS: C PTS: 1
89. ANS: B PTS: 1
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91. ANS: D PTS: 1
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93. ANS: A PTS: 1
94. ANS: A PTS: 1
95. ANS: D PTS: 1
96. ANS: D PTS: 1
97. ANS: B PTS: 1
98. ANS: D PTS: 1
99. ANS: C PTS: 1
100. ANS: B PTS: 1

# Final Organic Biochem Exam Spring 2010 [Version Map]

| | A | B | C | D |
|---|---|---|---|---|
| MC | 1 | 24 | 49 | 11 |
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| MC | 3 | 93 | 21 | 54 |
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| MC | 6 | 34 | 39 | 81 |
| MC | 7 | 58 | 2 | 49 |
| MC | 8 | 30 | 75 | 74 |
| MC | 9 | 84 | 10 | 88 |
| MC | 10 | 79 | 66 | 9 |
| MC | 11 | 66 | 86 | 46 |
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| MC | 13 | 3 | 77 | 66 |
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| MC | 39 | 31 | 79 | 52 |
| MC | 40 | 35 | 69 | 37 |
| MC | 41 | 61 | 7 | 5 |
| MC | 42 | 94 | 88 | 45 |
| MC | 43 | 70 | 100 | 96 |
| MC | 44 | 16 | 27 | 2 |
| MC | 45 | 78 | 31 | 99 |
| MC | 46 | 46 | 29 | 67 |
| MC | 47 | 85 | 18 | 62 |
| MC | 48 | 18 | 8 | 33 |
| MC | 49 | 43 | 12 | 72 |

| | A | B | C | D |
|---|---|---|---|---|
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| MC | 51 | 15 | 15 | 6 |
| MC | 52 | 86 | 96 | 76 |
| MC | 53 | 51 | 24 | 7 |
| MC | 54 | 92 | 78 | 65 |
| MC | 55 | 44 | 97 | 16 |
| MC | 56 | 37 | 94 | 41 |
| MC | 57 | 6 | 81 | 18 |
| MC | 58 | 75 | 14 | 39 |
| MC | 59 | 19 | 93 | 3 |
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| MC | 62 | 63 | 25 | 68 |
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| MC | 84 | 91 | 23 | 93 |
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| MC | 94 | 39 | 80 | 90 |
| MC | 95 | 76 | 99 | 8 |
| MC | 96 | 99 | 70 | 21 |
| MC | 97 | 27 | 85 | 48 |
| MC | 98 | 100 | 5 | 27 |

# Final Organic Biochem Exam Spring 2010 [Version Map]

| | A | B | C | D |
|---|---|---|---|---|
| MC | 99 | 29 | 26 | 92 |
| MC | 100 | 64 | 64 | 70 |