Student: _____

1. Enzyme inhibition
   A. refers to the interference with a chemical reaction caused by an enzyme.
   B. is the tendency to stop a chemical reaction caused by two different enzymes interfering with each other.
   C. is caused by a chemical that prevents the enzyme from acting on the natural substrate.
   D. is the ability of an enzyme to decrease the need for activation energy.

2. The point on the enzyme where the enzyme causes the substrate to change is called the
   A. attachment site.
   B. active site.
   C. binding site.
   D. enzyme-substrate complex.

3. A given enzyme works on
   A. any number of different substrates.
   B. one of two possible substrates.
   C. no substrate.
   D. one type of substrate.

4. A type of molecule that helps certain enzymes function is a(n)
   A. deactivator.
   B. antibiotic.
   C. vitamin.
   D. All of these answers are true.

5. The amount of energy needed to start two reactants to form a product is
   A. reaction energy.
   B. kinetic energy.
   C. activation energy.
   D. potential energy.

6. The optimum condition for an enzyme
   A. is 60°C.
   B. is where it works best.
   C. cannot be determined.
   D. All of these answers are true.

7. A molecule occupies the active site of an enzyme so that there can be no normal enzyme-substrate complex formed. This is called
   A. enzyme completion.
   B. denaturation.
   C. enzyme inhibition.
   D. enzyme specificity.

8. As the concentration of an enzyme increases for a given substrate,
   A. the reaction rate increases similarly.
   B. the turnover number decreases at the same rate that the enzyme concentration increases.
   C. the rate of the reaction decreases to a point.
   D. there is no change in the reaction.

9. An enzyme is also known as
   A. an inorganic protein.
   B. an organic catalyst.
   C. a metal ion.
   D. an inhibitor.

10. When you boil egg white (albumin is protein) you have
   A. inhibited the protein.
   B. denatured the protein.
   C. competed with the protein.
   D. optimized the protein.

11. Enzymes are
   A. fats.
   B. sugars.
   C. starches.
   D. proteins.

12. Enzyme competition occurs when
   A. one type of enzyme reacts with one type of substrate.
   B. an enzyme does not react with a substrate.
   C. three different types of enzymes react with one type of substrate.
   D. an enzyme stops a reaction.

13. It is FALSE that enzymes
   A. are catalysts.
   B. are proteins.
   C. lower the activation energy of a reaction.
   D. are used up in a reaction.

14. The number of molecules with which an enzyme reacts is the
   A. end product.
   B. optimum.
   C. substrate.
   D. turnover number.

15. An enzyme poison ____ enzyme function.
   A. balances
   B. prevents
   C. helps
   D. competes with

16. An increase in enzyme or substrate concentration will
   A. increase the amount of reaction.
   B. decrease the amount of reaction.
   C. not change the amount of product produced.
   D. interfere with the reaction.

17. The substrate is
   A. the material changed by an enzyme.
   B. a coenzyme.
   C. the material formed by an enzyme.
   D. always a protein.

18. An enzyme is about the same as a(n)
   A. catalyst.
   B. inhibitor.
   C. substrate.
   D. end product.

19. Denature means to permanently change a(n)
    A. amino acid.
    B. protein.
    C. fat.
    D. carbohydrate.

20. Several enzymes that fit the same substrate are
    A. the same as the substrate.
    B. not able to function.
    C. in competition for the same substrate.
    D. able to interact and form one complex of enzymes.

21. Every enzyme functions **best** at
    A. high pH.
    B. low pH.
    C. optimum pH.
    D. neutral pH.

22. The reason why an enzyme fits a specific substrate is due to its
    A. inhibitor.
    B. three-dimensional shape.
    C. acid side chain.
    D. nuclear membrane.

23. Using an enzyme in a chemical reaction will reduce the need for
    A. a coenzyme.
    B. an inhibitor.
    C. activation energy.
    D. end products.

24. Which of the following is an example of an enzyme-substrate complex?
    A. glucose
    B. glucase
    C. vitamin D
    D. sucrose-sucrase

25. The turnover number involves the rate of change in the
    A. enzyme.
    B. end product.
    C. coenzyme.
    D. substrate.

26. A protein that increases the rate of a chemical reaction is
    A. a substrate.
    B. a coenzyme.
    C. an enzyme.
    D. an inhibitor.

27. The material that is changed by the enzyme is the
    A. coenzyme.
    B. inhibitor.
    C. catalyst.
    D. substrate.

28. An example of an enzyme is
    A. maltose.
    B. fructose.
    C. hydrogen peroxide.
    D. dehydrogenase.

29. The active site is a part of the
    A. enzyme.
    B. inhibitor.
    C. substrate.
    D. end product.

30. If lipase breaks lipids into fatty acids and glycerol, then lipase can
    A. cause an additional breakdown of the fatty acid.
    B. cause the formation of lipids.
    C. work on amino acids.
    D. denature proteins.

31. The rate of an enzyme reaction is the
    A. optimum number.
    B. substrate number.
    C. turnover number.
    D. activation number.

32. When a protein is denatured, the turnover number will
    A. increase.
    B. remain the same.
    C. decrease.
    D. change with the pH.

33. An inhibitor will result in the production of
    A. more product.
    B. the same amount of product.
    C. less product.
    D. The answer depends upon the inhibitor.

34. A method of controlling the synthesis rate of molecules is called
    A. negative-feedback control.
    B. tertiary control.
    C. enzyme-inhibition control.
    D. depression-feedback control.

35. This mechanism is active when the end product of an enzyme-controlled biochemical pathway reaches a high enough concentration to interfere with one of the enzymes essential to the functioning of that pathway.
    A. end-product control
    B. negative-feedback control
    C. negative by-product control
    D. inhibition control

36. Chemical messengers in the cell that control the amounts of enzyme produced is/are
    A. DNA.
    B. gene regulator proteins.
    C. inhibitors.
    D. coenzymes.

37. As the amount of substrate is increased in an enzyme-substrate reaction,
    A. the amount of enzyme also increases proportionally.
    B. enzymes work faster.
    C. the amount of product increases.
    D. enzymes become denatured faster.

38. To denature an enzyme is to
    A. activate the enzyme.
    B. change the protein structure of the enzyme.
    C. increase the enzyme's turnover number.
    D. attach the enzyme to the substrate.

39. An inhibitor
    A. denatures an enzyme.
    B. attaches itself to the product, thereby preventing the product from functioning.
    C. attaches itself to the enzyme, thereby preventing the enzyme from forming the enzyme-substrate complex.
    D. renders the enzyme inactive by attaching positively charged hydrogen ions to the enzyme's side chains.

40. You could increase the amount of product produced over a given amount of time in an enzyme-mediated reaction by
    A. adding ice.
    B. adding an inhibitor.
    C. adding more enzyme.
    D. boiling the enzyme.

41. Acetyl can be a substrate for a number of different reactions involving different enzymes and resulting in different products. This situation can be described as
    A. enzymatic inhibition.
    B. negative-feedback inhibition.
    C. substrate competition.
    D. enzymatic competition.

42. It is FALSE that
    A. coenzymes are needed in many reactions to enable the enzyme to function as a catalyst.
    B. water-soluble vitamins like thiamine, riboflavin, and niacin can be converted to coenzymes.
    C. coenzymes are nonprotein molecules.
    D. coenzymes remain unchanged during a reaction.

43. Enzymatic competition results when
    A. several substrates can combine with one enzyme.
    B. one enzyme can bring about the formation of several substrates.
    C. several types of enzymes can combine with a given substrate.
    D. one enzyme can produce several types of products.

44. An enzyme's name is NOT likely to include
    A. the type of reaction the enzyme facilitates.
    B. the location in the body where the enzyme is commonly found.
    C. the substrate the enzyme works on.
    D. -ase.

45. The enzyme that facilitates a reaction adding a phosphate group to a three-carbon sugar while removing a hydrogen would most likely be named
    A. triose phosphate dehydrogenase.
    B. phosphoglyceromutase.
    C. pyruvate kinase.
    D. phosphofructokinase.

46. The induced fit hypothesis states that
    A. a single enzyme can adjust its shape to fit with several types of substrate.
    B. a substrate will adjust its shape to fit the shape of the enzyme.
    C. an enzyme can adjust itself to a substrate as they come together.
    D. the enzyme and substrate have no set shape until they unite.

47. An enzyme can
    A. reduce the rate of a chemical reaction.
    B. increase the rate of a chemical reaction as much as two times.
    C. increase the rate of a chemical reaction as much as ten times.
    D. increase the rate of a chemical reaction as much as several thousand times.

48. Enzymes are most directly involved with
    A. metabolic processes.
    B. generative processes.
    C. responsive processes.
    D. control processes.

49. The enzyme salivary amylase in the mouth breaks down starch into the simple sugar glucose. The mouth has a pH of 7. Salivary amylase will
    A. also break down starch in the stomach, which has a pH of 2.
    B. be able to break down proteins to amino acids in the stomach.
    C. not be able to break down starch in a test tube. It needs to be in the mouth.
    D. work at temperatures lower than body temperature (37°C).

50. Enzyme inhibitors
    A. slow enzyme-controlled reactions because the inhibitor prevents the substrate from attaching to the active site of the enzyme.
    B. are used to speed up enzyme-controlled reactions by inhibiting molecules that get in the way of the enzyme.
    C. are able to lower the temperature and slow down reactions.
    D. lower the pH and stop enzyme-controlled reactions.

51. The enzyme salivary amylase in the mouth breaks down starch into the simple sugar glucose. The mouth has a pH of 7. Salivary amylase will
    A. also break down starch in the stomach, which has a pH of 2.
    B. be able to break down proteins to amino acids in the stomach.
    C. be able to break down starch in a test tube. It doesn't need to be in the mouth.
    D. only work at body temperature.

52. The pH of the solution in which an enzyme-controlled reaction takes place
    A. is not important, since enzymes work well at a variety of pH levels.
    B. is important, because changing the pH changes the shape of the enzyme.
    C. is important, because changing the pH increases the temperature and the enzyme is denatured.
    D. alters the substrate and, therefore, prevents the enzyme from attaching to the substrate.

53. "I gave it a kick and you better believe it got going!" This statement sounds like
    A. whatever needed the kick was very stable to begin with.
    B. the kick served as activation energy.
    C. the kicker served as a catalyst.
    D. All of the choices are true.

54. In order for an enzyme to do its job, the substrate must fit into the
    A. coenzyme.
    B. repressor site.
    C. active site.
    D. substrate complex.

55. "Before you just dump that enzyme-active presoak into the washing machine, be sure to _____ so it will do a better job."
    A. rub it into the stained area to increase enzyme-substrate contact
    B. turn up the water temperature to boiling to get the enzyme molecules moving faster
    C. add chlorine bleach to the enzyme
    D. dilute the enzyme with water

56. Enzymes belong to which group of organic molecules?
    A. carbohydrates
    B. lipids
    C. nucleic acids
    D. proteins

57. An enzyme that works in the stomach may not work in the small intestine because
    A. the pH of the stomach contents is different than that found in the intestine.
    B. the temperature is so different that the enzyme will be inhibited from taking action.
    C. enzymatic competition will result in the denaturation of the substrate.
    D. there will not be enough collisions to result in enzyme-substrate formation.

58. "As I turned the temperature down, I found that there was a lower turnover number." This means
    A. there were fewer substrates in the reaction.
    B. fewer enzymes were synthesized.
    C. that the enzyme was operating at its optimum.
    D. the number of end products produced decreased.

59. Which type of enzyme is most likely to be involved in the loss of fat during exercise?
    A. carbohydrase
    B. lipase
    C. protease
    D. trypsin

60. Enzymatic competition involves
    A. one type of enzyme and several substrates.
    B. one type of substrate and several different types of enzymes.
    C. one type of substrate and several different types of enzymes that all work on this same substrate.
    D. no substrates, just two different enzymes acting on each other.

61. The importance of enzymatic competition is that
    A. different end products can be formed at different times when needed.
    B. it reduces the amount of enzymes in the cell to an optimum.
    C. it guarantees that all enzymes will form enzyme-substrate complexes.
    D. no substrates will go unchanged by an enzyme.

62. Physicians become very concerned when a person's body temperature rises above 40°C (104°F) since
    A. many enzymes essential to life will be negatively affected, i.e., denatured or slowed in their actions.
    B. nerve impulses will stop completely at this temperature.
    C. the patient will lose the ability to communicate.
    D. cell respiration will increase to the point of exhaustion.

63. If a cofactor is not protein but another kind of organic molecule it is called a(n)
    A. regulator lipid.
    B. coenzyme.
    C. substrate.
    D. catalyst.

64. Anti-viral drugs used to control certain viruses work by
    A. causing the virus to replicate out of control
    B. inhibiting the enzyme necessary for viral replication
    C. making the virus more permeable to the drug
    D. none of these

65. These types of compounds are a group of unrelated organic molecules, either water-soluble or fat-soluble, used in the manufacture of final products by acting as coenzymes.
    A. phosphates
    B. acids
    C. vitamins
    D. enzymes

66. Coenzymes such as _____ are used to carry electrons to and from many kinds of oxidation/reduction reactions.
    A. NAD^+
    B. Vitamin H
    C. purines
    D. zinc

67. Which of the following statements concerning photosynthesis and aerobic cellular respiration is false?

    A. Both are biochemical pathways.
    B. Both involve many enzyme-controlled reactions linked together.
    C. Both involve the transfer of energy.
    D. Photosynthesis occurs exclusively in plants and aerobic cellular respiration occurs exclusively in animals.

68. Which of the following pairs of terms go together?
    A. anabolism—anaerobic cellular respiration
    B. catabolism—aerobic cellular respiration
    C. anabolism—aerobic cellular respiration
    D. catabolism—photosynthesis

69. The proton pump is responsible for the production of
    A. ATPs.
    B. oxygen.
    C. ADP.
    D. All of these answers are true.

70. The proton pump involves the movement of
    A. ADP.
    B. hydrogen ions.
    C. ATP.
    D. All of these answers are true.

71. ATP contains ____ high-energy phosphate bonds.
    A. one
    B. two
    C. three
    D. four

72. Which statement below is FALSE regarding this chemical equation? ADP + P → ATP
    A. This reaction is known as phosphorylation.
    B. This reaction occurs in photosynthesis and cellular respiration.
    C. This reaction represents energy being released into the environment for cellular use.
    D. This reaction represents the formation of a high-energy phosphate bond.

73. ATP, ADP, and AMP differ in the
    A. type of sugar subunits they contain.
    B. number of sugar subunits they contain.
    C. number of adenine bases they contain.
    D. number of phosphate groups they contain.

74. The electron transport system uses ____ atoms.
    A. hydrogen
    B. carbon
    C. nitrogen
    D. All of these answers are true.

75. NAD carries ____ to the electron transport system.
    A. energy
    B. oxygen
    C. hydrogen electrons
    D. water

76. Which of the following molecules is LEAST like the other three in terms of function?
    A. NAD
    B. ATP
    C. FAD
    D. NADP

77. NAD is a(n)
    A. enzyme.
    B. electron carrier.
    C. product of photosynthesis.
    D. oxygen carrier.

78. The proton pump is the process of
    A. producing glyceraldehyde-3-phosphate in the stroma.
    B. forming ATP by creating a hydrogen ion gradient across a membrane.
    C. converting fats and proteins into carbohydrates.
    D. cellular respiration in plants.

5 Key

1. Enzyme inhibition
   A. refers to the interference with a chemical reaction caused by an enzyme.
   B. is the tendency to stop a chemical reaction caused by two different enzymes interfering with each other.
   C. is caused by a chemical that prevents the enzyme from acting on the natural substrate.
   D. is the ability of an enzyme to decrease the need for activation energy.

Blooms Level: 1. Remember
Enger - Chapter 05 #1
Learning Outcome: List what environmental factors are able to alter enzyme activity.
Section: 05.05
Topic: Metabolism

2. The point on the enzyme where the enzyme causes the substrate to change is called the
   A. attachment site.
   B. active site.
   C. binding site.
   D. enzyme-substrate complex.

Blooms Level: 1. Remember
Enger - Chapter 05 #2
Learning Outcome: Contrast active site and binding site.
Section: 05.02
Topic: Metabolism

3. A given enzyme works on
   A. any number of different substrates.
   B. one of two possible substrates.
   C. no substrate.
   D. one type of substrate.

Blooms Level: 1. Remember
Enger - Chapter 05 #3
Learning Outcome: Contrast active site and binding site.
Learning Outcome: Explain why enzymes are so important to all organisms.
Section: 05.02
Topic: Metabolism

4. A type of molecule that helps certain enzymes function is a(n)
   A. deactivator.
   B. antibiotic.
   C. vitamin.
   D. All of these answers are true.

Blooms Level: 1. Remember
Enger - Chapter 05 #4
Learning Outcome: Contrast cofactors, vitamins, and coenzymes.
Section: 05.03
Topic: Metabolism

5. The amount of energy needed to start two reactants to form a product is
   A. reaction energy.
   B. kinetic energy.
   C. activation energy.
   D. potential energy.

Blooms Level: 1. Remember
Enger - Chapter 05 #5
Learning Outcome: Define the term activation energy.
Section: 05.01
Topic: Metabolism

6. The optimum condition for an enzyme
A. is 60°C.
B. is where it works best.
C. cannot be determined.
D. All of these answers are true.

Blooms Level: 1. Remember
Enger - Chapter 05 #6
Learning Outcome: List what environmental factors are able to alter enzyme activity.
Section: 05.04
Topic: Metabolism

7. A molecule occupies the active site of an enzyme so that there can be no normal enzyme-substrate complex formed. This is called
A. enzyme completion.
B. denaturation.
C. enzyme inhibition.
D. enzyme specificity.

Blooms Level: 2. Understand
Enger - Chapter 05 #7
Learning Outcome: Describe enzymatic competition.
Section: 05.05
Topic: Metabolism

8. As the concentration of an enzyme increases for a given substrate,
A. the reaction rate increases similarly.
B. the turnover number decreases at the same rate that the enzyme concentration increases.
C. the rate of the reaction decreases to a point.
D. there is no change in the reaction.

Blooms Level: 5. Evaluate
Enger - Chapter 05 #8
Learning Outcome: Describe what happens when an enzyme and a substrate combine.
Section: 05.04
Topic: Metabolism

9. An enzyme is also known as
A. an inorganic protein.
B. an organic catalyst.
C. a metal ion.
D. an inhibitor.

Blooms Level: 1. Remember
Enger - Chapter 05 #9
Learning Outcome: Describe to which group of organic molecules enzymes belong.
Learning Outcome: Explain why enzymes are so important to all organisms.
Section: 05.01
Section: 05.02
Topic: Metabolism

10. When you boil egg white (albumin is protein) you have
A. inhibited the protein.
B. denatured the protein.
C. competed with the protein.
D. optimized the protein.

Blooms Level: 2. Understand
Enger - Chapter 05 #10
Learning Outcome: Define the term denature.
Section: 05.04
Topic: Metabolism

11. Enzymes are
A. fats.
B. sugars.
C. starches.
D. proteins.

Blooms Level: 1. Remember
Enger - Chapter 05 #11
Learning Outcome: Describe to which group of organic molecules enzymes belong.
Section: 05.01
Section: 05.02
Topic: Metabolism

12. Enzyme competition occurs when
A. one type of enzyme reacts with one type of substrate.
B. an enzyme does not react with a substrate.
C. three different types of enzymes react with one type of substrate.
D. an enzyme stops a reaction.

Blooms Level: 2. Understand
Enger - Chapter 05 #12
Learning Outcome: Describe enzymatic competition.
Section: 05.05
Topic: Metabolism

13. It is FALSE that enzymes
A. are catalysts.
B. are proteins.
C. lower the activation energy of a reaction.
D. are used up in a reaction.

Blooms Level: 1. Remember
Enger - Chapter 05 #13
Learning Outcome: Describe to which group of organic molecules enzymes belong.
Section: 05.01
Section: 05.02
Topic: Metabolism

14. The number of molecules with which an enzyme reacts is the
A. end product.
B. optimum.
C. substrate.
D. turnover number.

Blooms Level: 1. Remember
Enger - Chapter 05 #14
Learning Outcome: Describe what happens when an enzyme and a substrate combine.
Section: 05.02
Section: 05.04
Topic: Metabolism

15. An enzyme poison ____ enzyme function.
A. balances
B. prevents
C. helps
D. competes with

Blooms Level: 2. Understand
Enger - Chapter 05 #15
Learning Outcome: List what environmental factors are able to alter enzyme activity.
Section: 05.05
Topic: Metabolism

16. An increase in enzyme or substrate concentration will
A. increase the amount of reaction.
B. decrease the amount of reaction.
C. not change the amount of product produced.
D. interfere with the reaction.

Blooms Level: 2. Understand
Enger - Chapter 05 #16
Learning Outcome: Describe what happens when an enzyme and a substrate combine.
Section: 05.02
Topic: Metabolism

17. The substrate is
A. the material changed by an enzyme.
B. a coenzyme.
C. the material formed by an enzyme.
D. always a protein.

Blooms Level: 1. Remember
Enger - Chapter 05 #17
Learning Outcome: Describe what happens when an enzyme and a substrate combine.
Section: 05.01
Section: 05.02
Topic: Metabolism

18. An enzyme is about the same as a(n)
A. catalyst.
B. inhibitor.
C. substrate.
D. end product.

Blooms Level: 1. Remember
Enger - Chapter 05 #18
Learning Outcome: Describe what happens when an enzyme and a substrate combine.
Section: 05.01
Section: 05.02
Topic: Metabolism

19. Denature means to permanently change a(n)
A. amino acid.
B. protein.
C. fat.
D. carbohydrate.

Blooms Level: 1. Remember
Enger - Chapter 05 #19
Learning Outcome: Define the term denature.
Section: 05.04
Topic: Metabolism

20. Several enzymes that fit the same substrate are
A. the same as the substrate.
B. not able to function.
C. in competition for the same substrate.
D. able to interact and form one complex of enzymes.

Blooms Level: 1. Remember
Enger - Chapter 05 #20
Learning Outcome: Describe what happens when an enzyme and a substrate combine.
Section: 05.02
Topic: Metabolism

21. Every enzyme functions **best** at
A. high pH.
B. low pH.
C. optimum pH.
D. neutral pH.

Blooms Level: 1. Remember
Enger - Chapter 05 #21
Learning Outcome: List what environmental factors are able to alter enzyme activity.
Section: 05.04
Topic: Metabolism

22. The reason why an enzyme fits a specific substrate is due to its
A. inhibitor.
B. three-dimensional shape.
C. acid side chain.
D. nuclear membrane.

Blooms Level: 1. Remember
Enger - Chapter 05 #22
Learning Outcome: Contrast active site and binding site.
Section: 05.02
Topic: Metabolism

23. Using an enzyme in a chemical reaction will reduce the need for
A. a coenzyme.
B. an inhibitor.
C. activation energy.
D. end products.

Blooms Level: 2. Understand
Enger - Chapter 05 #23
Learning Outcome: Define the term activation energy.
Section: 05.01
Topic: Metabolism

24. Which of the following is an example of an enzyme-substrate complex?
A. glucose
B. glucase
C. vitamin D
D. sucrose-sucrase

Blooms Level: 1. Remember
Enger - Chapter 05 #24
Learning Outcome: Describe what happens when an enzyme and a substrate combine.
Section: 05.02
Topic: Metabolism

25. The turnover number involves the rate of change in the
A. enzyme.
B. end product.
C. coenzyme.
D. substrate.

Blooms Level: 2. Understand
Enger - Chapter 05 #25
Learning Outcome: Define the term turnover number.
Section: 05.04
Topic: Metabolism

26. A protein that increases the rate of a chemical reaction is
A. a substrate.
B. a coenzyme.
C. an enzyme.
D. an inhibitor.

Blooms Level: 1. Remember
Enger - Chapter 05 #26
Learning Outcome: Describe to which group of organic molecules enzymes belong.
Section: 05.01
Section: 05.02
Topic: Metabolism

27. The material that is changed by the enzyme is the
A. coenzyme.
B. inhibitor.
C. catalyst.
D. substrate.

Blooms Level: 1. Remember
Enger - Chapter 05 #27
Learning Outcome: Describe what happens when an enzyme and a substrate combine.
Section: 05.02
Topic: Metabolism

28. An example of an enzyme is
A. maltose.
B. fructose.
C. hydrogen peroxide.
D. dehydrogenase.

Blooms Level: 1. Remember
Enger - Chapter 05 #28
Learning Outcome: Describe to which group of organic molecules enzymes belong.
Learning Outcome: Describe what happens when an enzyme and a substrate combine.
Section: 05.02
Topic: Metabolism

29. The active site is a part of the
A. enzyme.
B. inhibitor.
C. substrate.
D. end product.

Blooms Level: 1. Remember
Enger - Chapter 05 #29
Learning Outcome: Contrast active site and binding site.
Section: 05.02
Topic: Metabolism

30. If lipase breaks lipids into fatty acids and glycerol, then lipase can
A. cause an additional breakdown of the fatty acid.
B. cause the formation of lipids.
C. work on amino acids.
D. denature proteins.

Blooms Level: 2. Understand
Enger - Chapter 05 #30
Learning Outcome: Describe what happens when an enzyme and a substrate combine.
Section: 05.02
Section: 05.04
Topic: Metabolism

31. The rate of an enzyme reaction is the
A. optimum number.
B. substrate number.
C. turnover number.
D. activation number.

Blooms Level: 2. Understand
Enger - Chapter 05 #31
Learning Outcome: Define the term turnover number.
Section: 05.04
Topic: Metabolism

32. When a protein is denatured, the turnover number will
A. increase.
B. remain the same.
C. decrease.
D. change with the pH.

Blooms Level: 3. Apply
Enger - Chapter 05 #32
Learning Outcome: Define the term denature.
Section: 05.04
Topic: Metabolism

33. An inhibitor will result in the production of
A. more product.
B. the same amount of product.
C. less product.
D. The answer depends upon the inhibitor.

Blooms Level: 1. Remember
Enger - Chapter 05 #33
Learning Outcome: Describe why enzymes work in some situations and not in others.
Section: 05.05
Topic: Metabolism

34. A method of controlling the synthesis rate of molecules is called
A. negative-feedback control.
B. tertiary control.
C. enzyme-inhibition control.
D. depression-feedback control.

Blooms Level: 1. Remember
Enger - Chapter 05 #34
Learning Outcome: Define the terms negative and positive feedback.
Section: 05.06
Topic: Metabolism

35. This mechanism is active when the end product of an enzyme-controlled biochemical pathway reaches a high enough concentration to interfere with one of the enzymes essential to the functioning of that pathway.
A. end-product control
B. negative-feedback control
C. negative by-product control
D. inhibition control

Blooms Level: 2. Understand
Enger - Chapter 05 #35
Learning Outcome: Define the terms negative and positive feedback.
Section: 05.06
Topic: Metabolism

36. Chemical messengers in the cell that control the amounts of enzyme produced is/are
A. DNA.
B. gene regulator proteins.
C. inhibitors.
D. coenzymes.

Blooms Level: 1. Remember
Enger - Chapter 05 #36
Learning Outcome: Explain the role played by gene-regulator proteins in enzyme action.
Section: 05.05
Topic: Metabolism

37. As the amount of substrate is increased in an enzyme-substrate reaction,
A. the amount of enzyme also increases proportionally.
B. enzymes work faster.
C. the amount of product increases.
D. enzymes become denatured faster.

Blooms Level: 5. Evaluate
Enger - Chapter 05 #37
Learning Outcome: Describe enzymatic competition.
Section: 05.05
Topic: Metabolism

38. To denature an enzyme is to
A. activate the enzyme.
B. change the protein structure of the enzyme.
C. increase the enzyme's turnover number.
D. attach the enzyme to the substrate.

Blooms Level: 1. Remember
Enger - Chapter 05 #38
Learning Outcome: Define the term denature.
Section: 05.04
Topic: Metabolism

39. An inhibitor
A. denatures an enzyme.
B. attaches itself to the product, thereby preventing the product from functioning.
C. attaches itself to the enzyme, thereby preventing the enzyme from forming the enzyme-substrate complex.
D. renders the enzyme inactive by attaching positively charged hydrogen ions to the enzyme's side chains.

Blooms Level: 1. Remember
Enger - Chapter 05 #39
Learning Outcome: List what environmental factors are able to alter enzyme activity.
Section: 05.05
Topic: Metabolism

40. You could increase the amount of product produced over a given amount of time in an enzyme-mediated reaction by
A. adding ice.
B. adding an inhibitor.
C. adding more enzyme.
D. boiling the enzyme.

Blooms Level: 5. Evaluate
Enger - Chapter 05 #40
Learning Outcome: Describe what happens when an enzyme and a substrate combine.
Section: 05.02
Topic: Metabolism

41. Acetyl can be a substrate for a number of different reactions involving different enzymes and resulting in different products. This situation can be described as
A. enzymatic inhibition.
B. negative-feedback inhibition.
C. substrate competition.
D. enzymatic competition.

Blooms Level: 5. Evaluate
Enger - Chapter 05 #41
Learning Outcome: Describe what happens when an enzyme and a substrate combine.
Section: 05.04
Section: 05.05
Topic: Metabolism

42. It is FALSE that
A. coenzymes are needed in many reactions to enable the enzyme to function as a catalyst.
B. water-soluble vitamins like thiamine, riboflavin, and niacin can be converted to coenzymes.
C. coenzymes are nonprotein molecules.
D. coenzymes remain unchanged during a reaction.

Blooms Level: 5. Evaluate
Enger - Chapter 05 #42
Learning Outcome: Contrast cofactors, vitamins, and coenzymes.
Section: 05.03
Topic: Metabolism

43. Enzymatic competition results when
A. several substrates can combine with one enzyme.
B. one enzyme can bring about the formation of several substrates.
C. several types of enzymes can combine with a given substrate.
D. one enzyme can produce several types of products.

Blooms Level: 1. Remember
Enger - Chapter 05 #43
Learning Outcome: Describe enzymatic competition.
Section: 05.05
Topic: Metabolism

44. An enzyme's name is NOT likely to include
A. the type of reaction the enzyme facilitates.
B. the location in the body where the enzyme is commonly found.
C. the substrate the enzyme works on.
D. -ase.

Blooms Level: 1. Remember
Enger - Chapter 05 #44
Learning Outcome: Describe to which group of organic molecules enzymes belong.
Section: 05.02
Topic: Metabolism

45. The enzyme that facilitates a reaction adding a phosphate group to a three-carbon sugar while removing a hydrogen would most likely be named
A. triose phosphate dehydrogenase.
B. phosphoglyceromutase.
C. pyruvate kinase.
D. phosphofructokinase.

Blooms Level: 2. Understand
Enger - Chapter 05 #45
Learning Outcome: Describe to which group of organic molecules enzymes belong.
Section: 05.02
Section: 05.06
Topic: Metabolism

46. The induced fit hypothesis states that
A. a single enzyme can adjust its shape to fit with several types of substrate.
B. a substrate will adjust its shape to fit the shape of the enzyme.
C. an enzyme can adjust itself to a substrate as they come together.
D. the enzyme and substrate have no set shape until they unite.

Blooms Level: 1. Remember
Enger - Chapter 05 #46
Learning Outcome: Relate the shape of an enzyme to its ability to help in a chemical reaction.
Section: 05.02
Topic: Metabolism

47. An enzyme can
A. reduce the rate of a chemical reaction.
B. increase the rate of a chemical reaction as much as two times.
C. increase the rate of a chemical reaction as much as ten times.
D. increase the rate of a chemical reaction as much as several thousand times.

Blooms Level: 1. Remember
Enger - Chapter 05 #47
Learning Outcome: Describe what happens when an enzyme and a substrate combine.
Section: 05.01
Section: 05.02
Topic: Metabolism

48. Enzymes are most directly involved with
A. metabolic processes.
B. generative processes.
C. responsive processes.
D. control processes.

Blooms Level: 2. Understand
Enger - Chapter 05 #48
Learning Outcome: Describe what happens when an enzyme and a substrate combine.
Learning Outcome: Explain why enzymes are so important to all organisms.
Section: 05.02
Section: 05.06
Topic: Metabolism

49. The enzyme salivary amylase in the mouth breaks down starch into the simple sugar glucose. The mouth has a pH of 7. Salivary amylase will
A. also break down starch in the stomach, which has a pH of 2.
B. be able to break down proteins to amino acids in the stomach.
C. not be able to break down starch in a test tube. It needs to be in the mouth.
D. work at temperatures lower than body temperature (37°C).

Blooms Level: 5. Evaluate
Enger - Chapter 05 #49
Learning Outcome: Describe why enzymes work in some situations and not in others.
Learning Outcome: List what environmental factors are able to alter enzyme activity.
Section: 05.04
Topic: Metabolism

50. Enzyme inhibitors
A. slow enzyme-controlled reactions because the inhibitor prevents the substrate from attaching to the active site of the enzyme.
B. are used to speed up enzyme-controlled reactions by inhibiting molecules that get in the way of the enzyme.
C. are able to lower the temperature and slow down reactions.
D. lower the pH and stop enzyme-controlled reactions.

Blooms Level: 1. Remember
Enger - Chapter 05 #50
Learning Outcome: List what environmental factors are able to alter enzyme activity.
Section: 05.05
Topic: Metabolism

51. The enzyme salivary amylase in the mouth breaks down starch into the simple sugar glucose. The mouth has a pH of 7. Salivary amylase will
A. also break down starch in the stomach, which has a pH of 2.
B. be able to break down proteins to amino acids in the stomach.
C. be able to break down starch in a test tube. It doesn't need to be in the mouth.
D. only work at body temperature.

Blooms Level: 5. Evaluate
Enger - Chapter 05 #51
Learning Outcome: Describe why enzymes work in some situations and not in others.
Learning Outcome: List what environmental factors are able to alter enzyme activity.
Section: 05.04
Topic: Metabolism

52. The pH of the solution in which an enzyme-controlled reaction takes place
A. is not important, since enzymes work well at a variety of pH levels.
B. is important, because changing the pH changes the shape of the enzyme.
C. is important, because changing the pH increases the temperature and the enzyme is denatured.
D. alters the substrate and, therefore, prevents the enzyme from attaching to the substrate.

Blooms Level: 2. Understand
Enger - Chapter 05 #52
Learning Outcome: List what environmental factors are able to alter enzyme activity.
Section: 05.04
Topic: Metabolism

53. "I gave it a kick and you better believe it got going!" This statement sounds like
A. whatever needed the kick was very stable to begin with.
B. the kick served as activation energy.
C. the kicker served as a catalyst.
D. All of the choices are true.

Blooms Level: 2. Understand
Enger - Chapter 05 #53
Learning Outcome: Define the term activation energy.
Section: 05.01
Section: 05.02
Topic: Metabolism

54. In order for an enzyme to do its job, the substrate must fit into the
A. coenzyme.
B. repressor site.
C. active site.
D. substrate complex.

Blooms Level: 1. Remember
Enger - Chapter 05 #54
Learning Outcome: Relate the shape of an enzyme to its ability to help in a chemical reaction.
Section: 05.02
Topic: Metabolism

55. "Before you just dump that enzyme-active presoak into the washing machine, be sure to _____ so it will do a better job."
A. rub it into the stained area to increase enzyme-substrate contact
B. turn up the water temperature to boiling to get the enzyme molecules moving faster
C. add chlorine bleach to the enzyme
D. dilute the enzyme with water

Blooms Level: 2. Understand
Enger - Chapter 05 #55
Learning Outcome: Describe what happens when an enzyme and a substrate combine.
Learning Outcome: Describe why enzymes work in some situations and not in others.
Section: 05.02
Section: 05.04
Topic: Metabolism

56. Enzymes belong to which group of organic molecules?
A. carbohydrates
B. lipids
C. nucleic acids
D. proteins

Blooms Level: 1. Remember
Enger - Chapter 05 #56
Learning Outcome: Describe to which group of organic molecules enzymes belong.
Section: 05.01
Section: 05.02
Topic: Metabolism

57. An enzyme that works in the stomach may not work in the small intestine because
A. the pH of the stomach contents is different than that found in the intestine.
B. the temperature is so different that the enzyme will be inhibited from taking action.
C. enzymatic competition will result in the denaturation of the substrate.
D. there will not be enough collisions to result in enzyme-substrate formation.

Blooms Level: 2. Understand
Enger - Chapter 05 #57
Learning Outcome: List what environmental factors are able to alter enzyme activity.
Section: 05.04
Topic: Metabolism

58. "As I turned the temperature down, I found that there was a lower turnover number." This means
A. there were fewer substrates in the reaction.
B. fewer enzymes were synthesized.
C. that the enzyme was operating at its optimum.
D. the number of end products produced decreased.

Blooms Level: 2. Understand
Enger - Chapter 05 #58
Learning Outcome: Define the term turnover number.
Section: 05.04
Topic: Metabolism

59. Which type of enzyme is most likely to be involved in the loss of fat during exercise?
A. carbohydrase
B. lipase
C. protease
D. trypsin

Blooms Level: 1. Remember
Enger - Chapter 05 #59
Learning Outcome: Describe what happens when an enzyme and a substrate combine.
Learning Outcome: Explain why enzymes are so important to all organisms.
Section: 05.06
Topic: Metabolism

60. Enzymatic competition involves
A. one type of enzyme and several substrates.
B. one type of substrate and several different types of enzymes.
C. one type of substrate and several different types of enzymes that all work on this same substrate.
D. no substrates, just two different enzymes acting on each other.

Blooms Level: 2. Understand
Enger - Chapter 05 #60
Learning Outcome: Describe enzymatic competition.
Section: 05.05
Topic: Metabolism

61. The importance of enzymatic competition is that
A. different end products can be formed at different times when needed.
B. it reduces the amount of enzymes in the cell to an optimum.
C. it guarantees that all enzymes will form enzyme-substrate complexes.
D. no substrates will go unchanged by an enzyme.

Blooms Level: 1. Remember
Enger - Chapter 05 #61
Learning Outcome: Describe enzymatic competition.
Section: 05.05
Topic: Metabolism

62. Physicians become very concerned when a person's body temperature rises above 40°C (104°F) since
A. many enzymes essential to life will be negatively affected, i.e., denatured or slowed in their actions.
B. nerve impulses will stop completely at this temperature.
C. the patient will lose the ability to communicate.
D. cell respiration will increase to the point of exhaustion.

Blooms Level: 2. Understand
Enger - Chapter 05 #62
Learning Outcome: List what environmental factors are able to alter enzyme activity.
Section: 05.04
Topic: Metabolism

63. If a cofactor is not protein but another kind of organic molecule it is called a(n)
A. regulator lipid.
B. coenzyme.
C. substrate.
D. catalyst.

Blooms Level: 2. Understand
Enger - Chapter 05 #63
Learning Outcome: Contrast cofactors, vitamins, and coenzymes.
Section: 05.03
Topic: Metabolism

64. Anti-viral drugs used to control certain viruses work by
A. causing the virus to replicate out of control
B. inhibiting the enzyme necessary for viral replication
C. making the virus more permeable to the drug
D. none of these

Blooms Level: 2. Understand
Enger - Chapter 05 #64
Learning Outcome: List what environmental factors are able to alter enzyme activity.
Section: 05.05
Topic: Metabolism

65. These types of compounds are a group of unrelated organic molecules, either water-soluble or fat-soluble, used in the manufacture of final products by acting as coenzymes.
A. phosphates
B. acids
C. vitamins
D. enzymes

Blooms Level: 1. Remember
Enger - Chapter 05 #65
Learning Outcome: Contrast cofactors, vitamins, and coenzymes.
Section: 05.02
Topic: Metabolism

66. Coenzymes such as _____ are used to carry electrons to and from many kinds of oxidation/ reduction reactions.
A. NAD^+
B. Vitamin H
C. purines
D. zinc

Blooms Level: 1. Remember
Enger - Chapter 05 #66
Learning Outcome: Contrast cofactors, vitamins, and coenzymes.
Section: 05.02
Topic: Metabolism

67. Which of the following statements concerning photosynthesis and aerobic cellular respiration is false?

A. Both are biochemical pathways.
B. Both involve many enzyme-controlled reactions linked together.
C. Both involve the transfer of energy.
D. Photosynthesis occurs exclusively in plants and aerobic cellular respiration occurs exclusively in animals.

Blooms Level: 5. Evaluate
Enger - Chapter 05 #67
Learning Outcome: Explain why enzymes are so important to all organisms.
Section: 05.06
Topic: Metabolism

68. Which of the following pairs of terms go together?
A. anabolism—anaerobic cellular respiration
B. catabolism—aerobic cellular respiration
C. anabolism—aerobic cellular respiration
D. catabolism—photosynthesis

Blooms Level: 2. Understand
Enger - Chapter 05 #68
Learning Outcome: Explain why enzymes are so important to all organisms.
Section: 05.06
Topic: Metabolism

69. The proton pump is responsible for the production of
A. ATPs.
B. oxygen.
C. ADP.
D. All of these answers are true.

Blooms Level: 1. Remember
Enger - Chapter 05 #69
Learning Outcome: Describe how the proton pump mechanism generates ATP.
Section: 05.06
Topic: Metabolism

70. The proton pump involves the movement of
A. ADP.
B. hydrogen ions.
C. ATP.
D. All of these answers are true.

Blooms Level: 1. Remember
Enger - Chapter 05 #70
Learning Outcome: Describe how the proton pump mechanism generates ATP.
Section: 05.06
Topic: Metabolism

71. ATP contains ____ high-energy phosphate bonds.
A. one
B. two
C. three
D. four

Blooms Level: 1. Remember
Enger - Chapter 05 #71
Learning Outcome: Explain the importance of ATP.
Section: 05.06
Topic: Metabolism

72. Which statement below is FALSE regarding this chemical equation? ADP + P → ATP
A. This reaction is known as phosphorylation.
B. This reaction occurs in photosynthesis and cellular respiration.
C. This reaction represents energy being released into the environment for cellular use.
D. This reaction represents the formation of a high-energy phosphate bond.

Blooms Level: 5. Evaluate
Enger - Chapter 05 #72
Learning Outcome: Explain the importance of ATP.
Section: 05.06
Topic: Metabolism

73. ATP, ADP, and AMP differ in the
A. type of sugar subunits they contain.
B. number of sugar subunits they contain.
C. number of adenine bases they contain.
D. number of phosphate groups they contain.

Blooms Level: 1. Remember
Enger - Chapter 05 #73
Learning Outcome: Explain the importance of ATP.
Section: 05.06
Topic: Metabolism

74. The electron transport system uses ____ atoms.
A. hydrogen
B. carbon
C. nitrogen
D. All of these answers are true.

Blooms Level: 1. Remember
Enger - Chapter 05 #74
Learning Outcome: Describe how the proton pump mechanism generates ATP.
Learning Outcome: Explain the importance of ATP.
Section: 05.06
Topic: Metabolism

75. NAD carries ____ to the electron transport system.
A. energy
B. oxygen
C. hydrogen electrons
D. water

Blooms Level: 1. Remember
Enger - Chapter 05 #75
Learning Outcome: Describe how the proton pump mechanism generates ATP.
Section: 05.06
Topic: Metabolism

76. Which of the following molecules is LEAST like the other three in terms of function?
A. NAD
B. ATP
C. FAD
D. NADP

Blooms Level: 2. Understand
Enger - Chapter 05 #76
Learning Outcome: Describe how the proton pump mechanism generates ATP.
Section: 05.06
Topic: Metabolism

77. NAD is a(n)
A. enzyme.
B. electron carrier.
C. product of photosynthesis.
D. oxygen carrier.

Blooms Level: 1. Remember
Enger - Chapter 05 #77
Learning Outcome: Describe how the proton pump mechanism generates ATP.
Section: 05.06
Topic: Metabolism

78. The proton pump is the process of
A. producing glyceraldehyde-3-phosphate in the stroma.
B. forming ATP by creating a hydrogen ion gradient across a membrane.
C. converting fats and proteins into carbohydrates.
D. cellular respiration in plants.

Blooms Level: 1. Remember
Enger - Chapter 05 #78
Learning Outcome: Describe how the proton pump mechanism generates ATP.
Section: 05.06
Topic: Metabolism

5 Summary

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