

This print-out should have 92 questions. Multiple-choice questions may continue on the next column or page – find all choices before answering.

Life Chemistry 33
001 10.0 points

Which of the following molecules have polar covalent bonds

1. O₂
2. CH₄
3. C₂H₆
4. CH₃OH **correct**
5. CO₂

Explanation:

LifeChem 15
002 10.0 points

The four elements most common in organisms are

1. phosphorus, water, carbon, and oxygen.
2. calcium, iron, hydrogen, and oxygen.
3. carbon, oxygen, hydrogen, and nitrogen. **correct**
4. nitrogen, carbon, iron, and hydrogen.
5. water, carbon, hydrogen, and oxygen.

Explanation:

LifeChem 33
003 10.0 points

All of the following are nonpolar except

1. CH₄.
2. N₂.
3. H₂.

4. O₂.

5. NaCl. **correct**

Explanation:

LifeChem 72
004 10.0 points

The notation [H⁺] refers to the

1. chemical reactivity of H⁺ ions.
2. concentration of H⁺ ions in moles per liter. **correct**
3. number of protons in an H⁺ ion.
4. number of H⁺ ions present in a solution.
5. charge of an H⁺ ion.

Explanation:

Chemistry life 54 CH2 Sec2
005 10.0 points

Your friend is having some difficulty understanding the nature of covalent bonding, especially single, double, and triple bonds.

Your best explanation would be that covalent bonds are bonds between atoms

1. that share electrons; for example, a single bond involves one electron, a double bond two electrons, and a triple bond three electrons.
2. with polar sides; for example, a single bond involves one electron and one proton, a double bond two electrons and two protons, and a triple bond three electrons and three protons.
3. in which the atoms receive electrons; for example, a single bond involves removing one electron, a double bond two electrons, and a triple bond three electrons.
4. which contain equal numbers of electrons.
5. in which the atoms share pairs of elec-

trons; for example, a single bond involves one pair of electrons, a double bond two pairs, and a triple bond three pairs of electrons.

correct

Explanation:

Recall

Holt Bio 02 10
006 10.0 points

The concentration of hydrogen ions in a solution with a pH of 4 is how many times that of a solution with a pH of 2?

1. 100 **correct**
2. 2
3. 10
4. 20
5. 1,000

Explanation:

The pH scale is logarithmic. Each pH changes $[H^+]$ by a factor of 10.

Holt Bio 02 12
007 10.0 points

A catalyst

1. eliminates the activation energy of a reaction.
 2. provides extra energy for a reaction.
 3. only allows irreversible reactions to occur.
 4. inhibits a reaction.
 5. lowers the activation energy of a reaction.
- correct**

Explanation:

Recall

Life Chemistry 06
008 10.0 points

Which of the following six elements make up

96% of living material?

1. C, H, O, S, Fe, Co
2. C, H, O, Fe, Mg, P
3. C, H, N, O, Fe, S
4. C, H, Mg, O, N, S
5. C, H, N, S, P, O **correct**

Explanation:

Carbohydrate, protein, lipid and nucleic acid are the major constituents of living material. The main elements that constitute the above complex molecules are: C, H, O, N, P, S,

Life Chemistry 10
009 10.0 points

The reactivity of an atom arises from

1. the average distance of the outermost electron shell from the nucleus.
2. the existence of unpaired electrons in the valence shell. **correct**
3. the sum of the potential energies of all of the electronic shells.
4. the potential energy of the valence shell.
5. the energy difference between the *s* and *p* orbitals.

Explanation:

The reactivity of atoms arises from the presence of unpaired electrons in one or more orbitals of their valence shells.

Life Chemistry 11
010 10.0 points

Which of the following terms includes all others in the list?

1. polysaccharide
2. monosaccharide

3. carbohydrate **correct**

4. disaccharide

5. starch

Explanation:

Polysaccharides are macromolecules, polymers with a few hundred to a few thousand monosaccharides joined by glycosidic linkages. The remaining in the list of choices are components of polysaccharides. All of the terms are carbohydrates.

Life Chemistry 27

011 10.0 points

A covalent bond is likely to be polar when

1. the two atoms sharing electrons are different elements.

2. one of the atoms sharing electrons is much more electronegative than the other atom. **correct**

3. it is between two atoms that are both very strong electron acceptors.

4. the two atoms sharing electrons are of the same element.

5. the two atoms sharing electrons are equally electronegative.

Explanation:

Life Chemistry 28

012 (part 1 of 3) 10.0 points

The phosphate group of DNA interacts with a positively charged amino acid side chain through

1. hydrophylic interactions.

2. an ionic bond. **correct**

3. hydrophobic interactions.

4. an H-bond.

5. a covalent bond.

Explanation:

013 (part 2 of 3) 10.0 points

When two amino acids with only —SH groups in their side chains interact, they would form

1. an ionic bond.

2. an H-bond.

3. hydrophobic interactions.

4. hydrophylic interactions.

5. a covalent bond. **correct**

Explanation:

014 (part 3 of 3) 10.0 points

Two amino acid side chains with only —CH₃ in their side chains will interact to form

1. an ionic bond.

2. a covalent bond.

3. hydrophylic interactions.

4. an H-bond.

5. hydrophobic interactions. **correct**

Explanation:

LifeChem 31

015 10.0 points

What determines if a molecule is polar, non-polar, or ionic?

1. The distance of the electrons from the nucleus

2. The number of protons

3. The differences in the electronegativities of the atoms **correct**

4. The bond distances

5. The ionic charges

Explanation:

LifeChem 36

016 10.0 points

Which of the following atoms usually has the greatest number of covalent bonds with other atoms?

1. Sulfur

2. Nitrogen

3. Hydrogen

4. Carbon **correct**

5. Oxygen

Explanation:

LifeChem 44

017 10.0 points

Cholesterol is composed primarily of carbon and hydrogen atoms. Therefore, one would expect cholesterol to be

1. insoluble in water. **correct**

2. an acid.

3. soluble in water.

4. a buffer.

5. a base.

Explanation:

GA SB1 56

018 10.0 points

Which of the macromolecules are built from carbon atoms that living organisms obtain from the carbon cycle?

1. all four macromolecules **correct**

2. carbohydrates

3. proteins

4. lipids

5. nucleic acids

Explanation:

All of the macromolecules contain carbon. Carbon forms the backbone of all living organisms and organic compounds.

GA SB1 57

019 10.0 points

Of the four macromolecules, only proteins and nucleic acids contain this important element.

1. hydrogen

2. carbon

3. nitrogen **correct**

4. oxygen

Explanation:

Nitrogen is found only in proteins (in each amino acid), and in the nucleotides that make up nucleic acids. This is why we stressed the importance of the nitrogen cycle.

LifeOrigin 03

020 10.0 points

The bonds that form between the units of polymeric macromolecules are _____ bonds.

1. covalent **correct**

2. disulfide

3. ionic

4. hydrogen

5. peptide

Explanation:

Carbohydrate 01

021 10.0 points

The molecular formula for glucose is $C_6H_{12}O_6$.

What would be the molecular formula for a polymer by linking ten glucose molecules together by dehydration reactions?

1. $C_{60}H_{111}O_{51}$
2. $C_6H_{12}O_6$
3. $C_{60}H_{120}O_{60}$
4. $C_{60}H_{102}O_{51}$ **correct**
5. $C_{60}H_{100}O_{50}$

Explanation:

When two glucose molecules are joined together via a dehydration reaction, water is lost. To connect ten glucose molecules (10x6 C, 10x12 H, 10x6 O) would require nine dehydration reactions, which comes to a total loss of 18 hydrogen atoms and 9 oxygen atoms. Thus, there would be 60 C, 102 (120-18) H, and 51 (60-9) O.

GA SB1 20

022 10.0 points

Glycogen is an example of a

1. plant starch.
2. monosaccharide.
3. polysaccharide. **correct**
4. disaccharide.

Explanation:

Glycogen is the way that animal cells store sugar by linking small monosaccharides together in a long chain. “Poly” is a root word meaning “many”.

Fatty acids

023 10.0 points

Which of the following statements concerning *unsaturated* fats is correct?

1. They have fewer fatty acid molecules per

fat molecule.

2. They are more common in animals than in plants.
3. They generally solidify at room temperature.
4. They have double bonds in the carbon chains of their fatty acids. **correct**
5. They contain more hydrogen than saturated fats having the same number of carbon atoms.

Explanation:

Unlike a saturated fatty acid, an unsaturated fatty acid has one or more double bonds, formed by the removal of hydrogen atoms from the carbon skeleton.

LifeOrigin 45

024 10.0 points

Lipids are

1. hydrophobic.
2. insoluble in water.
3. important constituents of biological membranes.
4. important for energy storage.
5. All of these **correct**

Explanation:

LifeOrigin 51

025 10.0 points

Lipids form the barriers surrounding various compartments within an organism. Which property of lipids makes them a good barrier?

1. Lipids store energy.
2. Many biologically important molecules are not soluble in lipids. **correct**
3. Lipids release large amounts of energy

when broken down.

- Lipids are polymers.
- Triglycerides are lipids.

Explanation:

LifeOrigin 52

026 10.0 points

You look at the label on a container of shortening and see “hydrogenated vegetable oil.” This means that during processing the number of carbon-carbon double bonds in the oil was decreased. What is the result of decreasing the number of double bonds?

- There are more “kinks” in the fatty acid chains.
- The fatty acid is now a triglyceride.
- The oil is now a derivative carbohydrate.
- The oil is now a solid at room temperature. **correct**
- The oil now has a lower melting point.

Explanation:

LifeOrigin 53

027 10.0 points

The portion of a phospholipid that contains the phosphorous group has one or more electric charges. That makes this region of the molecule

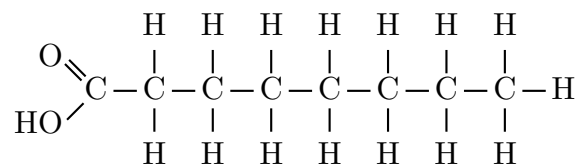
- nonpolar.
- unsaturated.
- hydrophobic.
- hydrophilic. **correct**
- saturated.

Explanation:

Macromolecules 16

028 10.0 points

The molecule



is

- a saturated fatty acid. **correct**
- a common component of plant oils.
- a polyunsaturated triglyceride.
- an unsaturated fatty acid.
- a steroid.

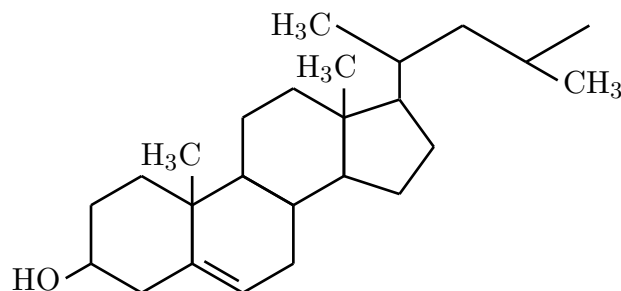
Explanation:

The lack of double bonds on the hydrocarbon chain and the presence of a carboxyl group indicate that this is a saturated fatty acid.

Macromolecules 20

029 10.0 points

Consider the structure



What is it?

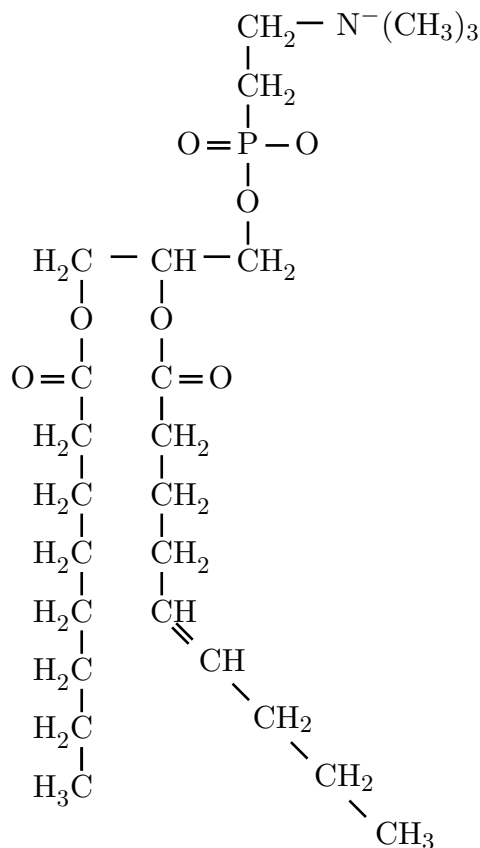
- a starch molecule
- a protein
- a steroid **correct**
- a nucleotide
- a cellulose molecule

Explanation:

Steroids have four fused carbon rings and various functional groups attached to them.

Macromolecules 22
030 (part 1 of 2) 10.0 points

The molecule



is a

1. triglyceride.
2. monoglyceride.
3. protein.
4. phospholipid. **correct**
5. steroid.

Explanation:

Recall and application

031 (part 2 of 2) 10.0 points

Which part of a cell will contain this molecule as its main component?

1. cell membrane **correct**
2. cytoplasm
3. cytoskeleton
4. cell wall
5. nucleus

Explanation:

The above molecule is a phospholipid; they are major components of cell membranes.

GA SB1 18

032 10.0 points

Amino acids differ from one another because of their

1. R group. **correct**
2. amino group.
3. carboxyl group.
4. central carbon.
5. glucose group.

Explanation:

Amino acids all have a central carbon with a carboxyl group and amino group in order to link together (a carboxyl end connects to the amino end like boxcars linking to make a train). Each amino acid has a different “R” group; however, the “R” represents different atoms chemically bonded to each other.

Holt Bio 02 11

033 10.0 points

Protein folding is determined by

1. None of these
2. All of these **correct**
3. how amino acids interact with water.
4. the sequence of the amino acids.

5. how amino acids interact with each other.

Explanation:

Recall

LifeOrigin 12

034 10.0 points

The side chain of leucine is a hydrocarbon. In a folded protein, where would you expect to find this residue?

1. Both in the interior of a cytoplasmic enzyme and on the exterior of a cytoplasmic enzyme

2. Both in the interior of a cytoplasmic enzyme and on the exterior of a protein embedded in a membrane **correct**

3. On the exterior of a cytoplasmic enzyme

4. In the interior of a cytoplasmic enzyme

5. On the exterior of a protein embedded in a membrane

Explanation:

Hydrocarbons are hydrophobic, so they would be folded into the enzyme when in the cytoplasm or exposed to the outside when in the hydrophobic environment of the membrane.

LifeOrigin 19

035 10.0 points

The tertiary structure of a protein is determined by its

1. branching.

2. hydrogen bonding.

3. right-handed coil.

4. glycosidic linkages.

5. interactions among R groups. **correct**

Explanation:

Explanation

LifeOrigin 23

036 10.0 points

When a protein loses its three-dimensional structure and becomes nonfunctional it is

1. environmentalized.

2. denatured. **correct**

3. reversible.

4. hydrolyzed.

5. permanent.

Explanation:

Macromolecules 29

037 10.0 points

How many water molecules were released during the synthesis of a protein that contains 500 amino acids ?

1. unknown

2. 500

3. 501

4. 499 **correct**

5. countless

Explanation:

Comprehension

Macromolecules 40

038 10.0 points

The DNA encoding a protein will be mainly responsible in determining the

1. double helix of protein.

2. beta 1-4 linkages in cellulose.

3. primary structure of a protein. **correct**

4. twisting of a fatty acid chain.

5. secondary structure of a polysaccharide.

Explanation:

Comprehension

Macromolecules 85

039 10.0 points

Which biological molecule can be an acid or a base, polar or non-polar, and charged or uncharged?

1. cellulose
2. phospholipid
3. protein **correct**
4. starch
5. steroid

Explanation:

Raven3 38

040 10.0 points

Proteins offer all of the following functions *except*

1. encoding genetic information. **correct**
2. cell recognition.
3. metabolism.
4. membrane transport.
5. structure.

Explanation:

Recall

StarrW 03 06

041 10.0 points

A denatured protein or DNA molecule has lost its

1. shape.
2. function.
3. All of these **correct**

4. None of these

5. hydrogen bonds.

Explanation:

Recall

EEM 32

042 10.0 points

Trypsin and elastase are both enzymes that catalyze hydrolysis of peptide bonds. But trypsin only cuts next to lysine and elastase only cuts next to alanine. Why?

1. Hydrolysis of lysine bonds requires water; hydrolysis of alanine bonds does not.
2. One of the reactions is endergonic and the other is exergonic.
3. ΔG for the two reactions is different.
4. The shape of the active site for the two enzymes is different. **correct**
5. Trypsin is a protein, and elastase is not.

Explanation:

EEM 35

043 10.0 points

In some cases, a substrate-enzyme complex is stabilized by

1. All of these **correct**
2. hydrogen bonds.
3. covalent bonds.
4. ionic attractions.
5. hydrophobic interactions.

Explanation:

EEM 37

044 10.0 points

The enzyme sucrase increases the rate at

which sucrose is broken down into glucose and fructose. Sucrase works by

1. supplying energy to speed up the reaction.
2. increasing the amount of free energy of the reaction.
3. decreasing the equilibrium constant of the reaction.
4. lowering the activation energy of the reaction. **correct**
5. changing the shape of the active site.

Explanation:

EEM 38

045 10.0 points

Which of the following statements about enzymes is true?

1. Enzymes have a specific amino acid sequence.
2. Enzymes lower the energy barrier.
3. Enzymes are proteins.
4. All of these **correct**
5. Enzymes are highly specific.

Explanation:

EEM 41

046 10.0 points

The enzyme glucose oxidase binds the six-carbon sugar glucose and catalyzes its conversion to glucono-1,4-lactone. Mannose is also a six-carbon sugar, but glucose oxidase cannot bind mannose. The specificity of glucose oxidase is based on the

1. three-dimensional shape and structure of the active site. **correct**
2. free energy of the transition state.

3. change in free energy of the reaction.
4. rate constant of the reaction.
5. activation energy of the reaction.

Explanation:

EEM 48

047 10.0 points

In the presence of alcohol dehydrogenase, the rate of reduction of acetaldehyde to ethanol increases as the concentration of acetaldehyde is increased. Eventually, the rate of the reaction reaches a maximum, at which point further increases in the concentration of acetaldehyde have no effect. Why?

1. The enzyme is no longer specific for acetaldehyde.
2. At high concentrations of acetaldehyde, the activation energy of the reaction decreases.
3. All of the alcohol dehydrogenase molecules are bound to acetaldehyde molecules. **correct**
4. At high concentrations of acetaldehyde, the change in free energy of the reaction decreases.
5. At high concentrations of acetaldehyde, the activation energy of the reaction increases.

Explanation:

EEM 53

048 10.0 points

How do competitive and noncompetitive enzyme inhibitors differ?

1. They function at different pH values.
2. Competitive inhibitors bind to the active site, whereas noncompetitive inhibitors change the shape of the active site. **correct**

3. Competitive inhibitors have a higher energy of activation than noncompetitive inhibitors have.

4. Noncompetitive enzyme inhibitors contain magnesium, whereas competitive inhibitors contain iron.

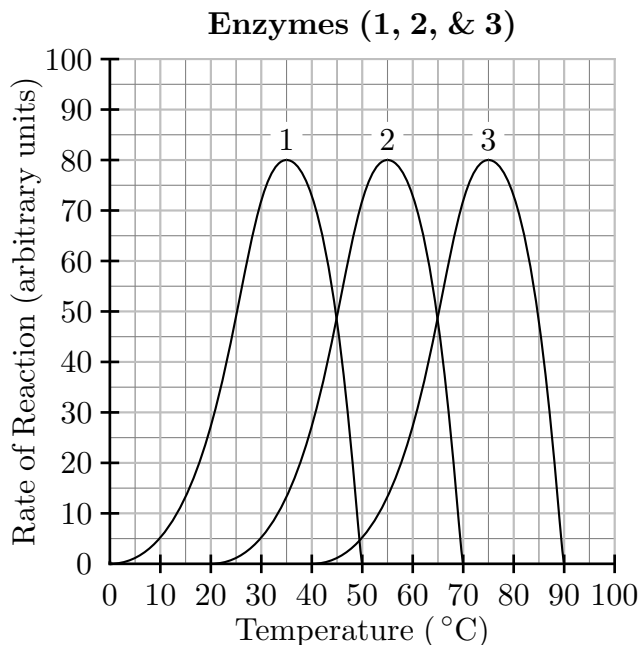
5. Noncompetitive enzyme inhibitors are reversible, whereas competitive inhibitors are irreversible.

Explanation:

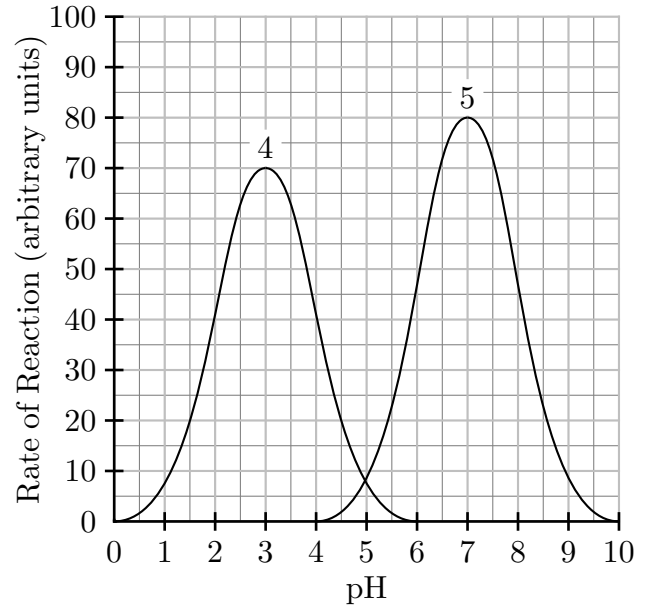
Metabolism 40

049 (part 1 of 2) 10.0 points

Five different enzymes were used in the following study to generate these two figures. The enzyme numbers are marked above each curve.



Enzymes (4 & 5)



Which enzyme works the best in a hot springs with a temperature of 70°C or higher?

1. Enzyme 4
2. Enzyme 1
3. Enzyme 5
4. Enzyme 3 **correct**
5. Enzyme 2

Explanation:

Comprehension.

050 (part 2 of 2) 10.0 points

What is the optimum temperature for enzyme 2?

1. 75°C
2. 45°C
3. 55°C **correct**
4. 35°C
5. 0°C

Explanation:

Comprehension.

Metabolism 44**051 10.0 points**

Which of the following could be reduced by increasing the substrate concentration in an enzymatic reaction?

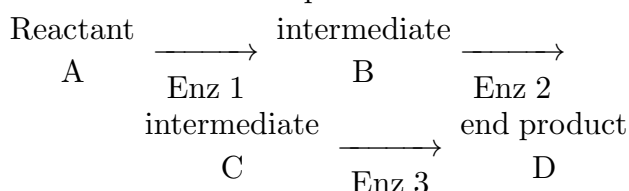
1. organic cofactors
2. competitive inhibition **correct**
3. inorganic cofactors
4. non-competitive inhibition
5. concentration of the enzyme

Explanation:

Comprehension.

Metabolism 49**052 10.0 points**

Consider the multistep reaction



This binding of D decreases the activity of the enzyme 1. Compound X binds to the active site of enzyme 1 and blocks its activity.

Substance X is

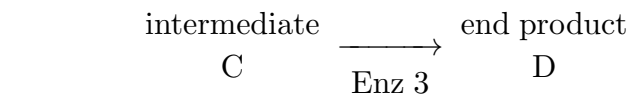
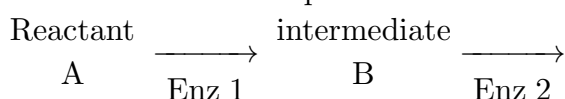
1. the product.
2. a substrate.
3. a competitive inhibitor. **correct**
4. a non-competitive inhibitor.
5. an intermediate.

Explanation:

Comprehension.

Metabolism 52**053 10.0 points**

Consider the multistep reaction



This binding of D decreases the activity of the enzyme 1. Compound X binds to the active site of enzyme 1 and block its activity.

Which of the following will reduce or overcome the inhibition of enzyme 1 by compound X?

1. Lower the activation energy needed.
2. Increase the activation energy needed.
3. Decrease the concentration of all the reactants.
4. Increase the concentration of reactant A. **correct**
5. Decrease the concentration of reactant A.

Explanation:

Comprehension.

Metabolism 53**054 10.0 points**

Which of the following is *correct* regarding cooperativity of an allosteric enzyme?

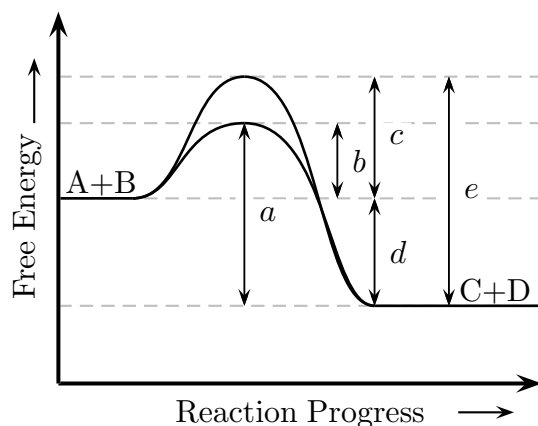
1. Several reactants can be catalyzed by the same enzyme.
2. A molecule bound to one subunit of a complex enzyme affects the binding affinity of the rest of the subunits. **correct**
3. A product binds to an active site and inhibits enzyme activity.
4. An enzyme complex contains all of the things needed for the pathway.
5. A substrate binds to an active site and inhibits enzyme activity.

Explanation:

Factual recall

Metabolism 54**055 10.0 points**

Consider the reaction $A + B \rightarrow C + D$ below.



Which of the following will have the highest level of free energy?

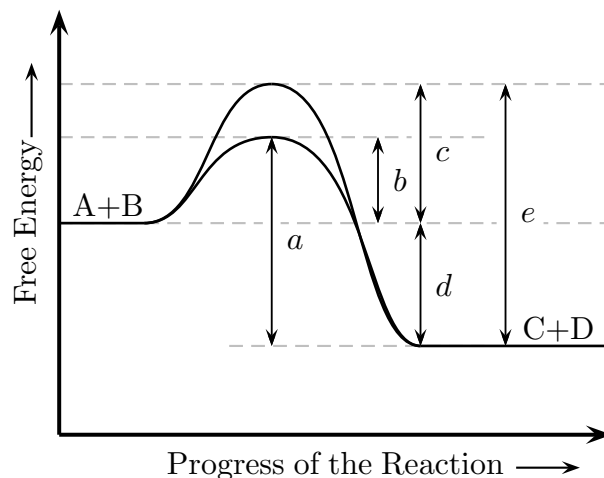
1. Cannot say anything about this without temperature information.
2. reactants A+B
3. products C+D
4. Both reactants and products have the same level.
5. transition states (not shown) **correct**

Explanation:

The transition state analogs are modified substrates with strained chemical bonds and they have the highest free energy in this reaction.

Metabolism 57**056 10.0 points**

Consider the reaction $A + B \rightarrow C + D$ below.



Which of the following would remain the same with or without an enzyme?

1. **d correct**
2. e
3. b
4. a
5. c

Explanation:

Enzymes do not change ΔG .

Metabolism 73**057 10.0 points**

What is true regarding the induced fit of enzymes?

1. Enzymes bind to its substrate and change its shape accordingly. **correct**
2. The binding of the substrate does not depend on the active site.
3. Some enzymes are rigid in their structure and nothing changes them.
4. The active site creates a hydrophobic condition ideal for the reaction.
5. Enzymes are like locks and the substrate is like a key; they fit exactly.

Explanation:

Factual recall

Metabolism 76

058 10.0 points

Enzymes involved in a particular metabolic pathway are located near each other on a membrane.

How does this benefit the cells?

1. It provides order and promotes efficiency in metabolic process. **correct**
2. It allows the use of ATP and cofactors by the enzyme.
3. It protects the enzyme from competitive inhibition.
4. It helps to follow the first law of thermodynamics.
5. It is restricted to membranes because the enzymes are hydrophilic.

Explanation:

Comprehension

Raven5 16

059 10.0 points

Small cells function more effectively, because as cells become larger their surface area to volume ratio

1. increases.
2. stays the same.
3. is cubed.
4. is squared.
5. decreases. **correct**

Explanation:

Recall

CellMembrane 03

060 10.0 points

Which of the following statements about the proteins of the plasma membrane and the

proteins of the inner mitochondrial membrane is true?

1. Only the mitochondrial membrane has integral proteins.
2. Both membranes have only peripheral proteins.
3. The two membranes differ in their lipid composition. **correct**
4. All of the proteins from both membranes are hydrophilic.
5. Only the mitochondrial membrane has peripheral proteins.

Explanation:

CellMembrane 04

061 10.0 points

The plasma membrane of animals contains carbohydrates

1. on both sides of the membrane.
2. on the inner side of the membrane, facing the cytosol.
3. on the outer side of the membrane, protruding into the environment. **correct**
4. on neither side of the membrane.
5. within the membrane.

Explanation:

CellMembrane 05

062 10.0 points

In biological membranes, the phospholipids are arranged in a

1. bilayer, with the fatty acids facing outward.
2. bilayer, with the fatty acids pointing toward each other. **correct**

3. single layer, with the fatty acids facing the interior of the cell.

4. single layer, with the phosphorus-containing region facing the interior of the cell.

5. bilayer, with the phosphorus groups in the interior of the membrane.

Explanation:

CellMembrane 06
063 10.0 points

Cholesterol molecules in animal cell membranes act to

1. block enzyme activity.
2. maintain the fluidity of the membrane. **correct**
3. disrupt membrane function.
4. transport ions across membranes.
5. attach to carbohydrates.

Explanation:

Cholesterol being non-polar molecule helps maintain membrane fluidity in animal cells. As the cholesterol content increases the fluidity and cell transport increases up to some extent and then start to decrease. In general it helps maintain membrane fluidity.

CellMembrane 12
064 10.0 points

A characteristic of plasma membranes that helps them fuse during vesicle formation and phagocytosis is the

1. asymmetrical distribution of membrane proteins.
2. capacity of lipids to associate and maintain a bilayer organization. **correct**
3. ratio of one protein molecule for every 25 phospholipid molecules.

4. ability of phospholipid molecules to flip over and trade places with other phospholipid molecules.

5. constant fatty acid chain length and degree of saturation.

Explanation:

CellMembrane 13
065 10.0 points

The plasma membranes of winter wheat are able to remain fluid when it is extremely cold by

1. increasing the number of cholesterol molecules present.
2. using fatty acids with longer tails.
3. decreasing the number of hydrophobic proteins present.
4. replacing saturated fatty acids with unsaturated fatty acids. **correct**
5. closing protein channels.

Explanation:

CellMembrane 16
066 10.0 points

The LDL receptor is an integral protein that crosses the plasma membrane, with portions of the protein extending both outside and into the interior of the cell. The amino acid side chains (R groups) in the region of the protein that crosses the membrane are most likely

1. charged.
2. hydrophobic. **correct**
3. lipids.
4. carbohydrates.
5. hydrophilic.

Explanation:

CellMembrane 33**067 10.0 points**

A concentration gradient of glucose across a membrane means that

1. the glucose molecules are chemically more tightly bonded on one side than on the other.
2. there are more moles of glucose on one side of the membrane than on the other.
3. there are more glucose molecules within the membrane than outside the membrane.
4. there is less water on one side of the membrane than on the other.
5. glucose molecules are more crowded on one side of the membrane than on the other. **correct**

Explanation:

CellMembrane 34**068 10.0 points**

When placed in water, wilted plants lose their limpness because of

1. active transport of salts from the water into the plant cells.
2. osmosis of water into the plant cells. **correct**
3. osmosis of water from the plant cells.
4. diffusion of water from the plant cells.
5. active transport of salts into the water from the plant cells.

Explanation:

CellMembrane 40**069 10.0 points**

When a severely dehydrated patient is brought to the hospital, an IV of normal saline is started immediately. Distilled water is not

used because

1. it would cause water to leave the cells and the cells would collapse.
2. it would cause blood cells to swell and eventually burst. **correct**
3. the distilled water might be contaminated by bacteria.
4. nutrients are provided by the saline.
5. normal saline is more economical.

Explanation:

CellMembrane 43**070 10.0 points**

If a red blood cell is placed in an isotonic solution,

1. the cell will swell and then return to normal.
2. the cell will swell and burst.
3. the cell will shrivel and then return to normal.
4. water moves into and out of the cell at an equal rate. **correct**
5. the cell will shrivel.

Explanation:

CellMembrane 45**071 10.0 points**

Which of the following statements about channel proteins is true?

1. They have a central pore of polar amino acids and water.
2. They are anchored in the hydrophobic bilayer of the plasma membrane.
3. They are surrounded by nonpolar amino acids.

4. All of these **correct**

5. They are usually gated.

Explanation:

Membrane 01

072 10.0 points

Which of the following functions of glycoproteins and glycolipids of animal cell membranes are most important?

1. maintaining membrane fluidity at low temperatures
2. facilitating the diffusion of molecules down their concentration gradients
3. the ability of cells to recognize like and different cells **correct**
4. maintaining the integrity of a fluid mosaic membrane
5. assisting the active transport of molecules against their concentration gradients

Explanation:

Glycoproteins and glycolipids enable cells to recognize similar and different cells. The diversity of the molecules and their location on the surface of cells enable oligosaccharides to function as markers that distinguish one cell from the other.

Membrane 02

073 10.0 points

Which of the following about membrane structure and function is *not* true?

1. Diffusion, osmosis, and facilitated diffusion do not require any energy input from the cell.
2. Special membrane proteins can cotransport two solutes by coupling diffusion with active transport.
3. Voltage across a membrane depends on an

unequal distribution of ions across the plasma membrane.

4. Both sides of a membrane are identical in structure and function. **correct**

5. Diffusion of gases is faster in air than across membranes.

Explanation:

Both sides of a cell membrane are not identical.

Membrane 07

074 10.0 points

Some elements can pass through the lipid bilayer rather quickly, while others take some time.

Of the following, which would move through the lipid bilayer of a plasma membrane most rapidly?

1. CO₂ **correct**
2. K⁺
3. starch
4. an amino acid
5. glucose

Explanation:

Only CO₂ passes through the lipid bilayer quickly.

CellMembrane 18

075 10.0 points

When vesicles from the Golgi apparatus deliver their contents to the exterior of the cell, they add their membranes to the plasma membrane. The plasma membrane does not increase in size, because

1. membrane is continually being lost from the plasma membrane by endocytosis. **correct**
2. membrane vesicles carry proteins from the endoplasmic reticulum to the Golgi appa-

ratus.

3. some vesicles from the Golgi apparatus fuse with the lysosomes.

4. new phospholipids are synthesized in the endoplasmic reticulum.

5. the phospholipids become more tightly packed together in the membrane.

Explanation:

CellMembrane 37

076 10.0 points

Osmosis is a specific form of

1. movement of water by carrier proteins.
2. diffusion. **correct**
3. facilitated transport.
4. secondary active transport.
5. active transport.

Explanation:

CellMembrane 38

077 10.0 points

Osmosis moves water from a region of _____ to a region of _____.

1. high concentration of dissolved material; low concentration of dissolved material
2. hyperosmotic solution; hyposmotic solution
3. low concentration of dissolved material; high concentration of dissolved material **correct**
4. negative osmotic potential; positive osmotic potential
5. low concentration of water; high concentration of water

Explanation:

explanation

CellMembrane 39

078 10.0 points

Which of the following molecules is the most likely to diffuse across a cell membrane?

1. A steroid **correct**
2. Na^+
3. Cl^-
4. A common amino acid
5. Glucose

Explanation:

CellMembrane 49

079 10.0 points

In a hypothetical study, cells are placed in a solution of glucose in which the concentration of glucose is gradually increased. At first, the rate at which glucose enters the cells is found to increase as the concentration of the glucose solution is increased. But when the glucose concentration of the solution is increased above 10 M, the rate no longer increases. Which of the following is the likely mechanism for glucose transport into these cells?

1. Facilitated diffusion via a channel protein
2. Symport
3. Facilitated diffusion via a carrier protein **correct**
4. Secondary active transport
5. Pinocytosis

Explanation:

CellMembrane 51

080 10.0 points

Active transport usually moves molecules

1. toward higher osmotic potential.
2. down the concentration gradient.
3. toward higher pH.
4. in a direction that tends to bring about equilibrium.
5. against concentration gradient. **correct**

Explanation:

Active transport uses energy to move molecules from lower concentration to higher concentration, i.e. against the gradient.

GA SB1 12
081 10.0 points

Which statement is true about facilitated diffusion?

1. Energy is required to move molecules against a concentration gradient.
2. Transport proteins are required to move molecules against a concentration gradient.
3. Transport proteins are required to move molecules down a concentration gradient. **correct**
4. Transport proteins and energy are required to move molecules against a concentration gradient.

Explanation:

Diffusion refers to molecules moving down a concentration gradient; transport proteins are needed to facilitate, or help, large molecules and charged ions diffuse. Energy is not required in this process.

GA SB1 13
082 10.0 points

Placing a plant cell in a hypotonic solution will cause the cell to

1. divide.

2. shrivel.
3. not change at all.
4. burst.
5. swell. **correct**

Explanation:

In hypotonic solutions, there is less solute (and therefore more water) outside the cell; therefore, water will rush into the cell. Plant cells prefer this environment, and use the water to keep the stem upright and rigid. Unlike animal cells, plant cells have cell walls to prevent the cell from bursting.

GA SB1 30
083 10.0 points

A red blood cell is placed in a hypertonic sodium chloride solution. Its cell membrane is impermeable to sodium and chlorine ions; thus, the blood cell will probably

1. remain unaffected by the solution.
2. lose all of its hemoglobin molecules.
3. shrink when water leaves the cell. **correct**
4. burst when water enters the cell.

Explanation:

If the solution is hypertonic, there is more solute (and therefore less water) outside the cell. If only water can move through the membrane, it will move from high to low concentration. In this situation, it will move outside the cell, causing the cell to shrink.

Holt Bio 04 06
084 10.0 points

Which of the following is NOT a characteristic of an ion channel?

1. It extends from one side of the cell membrane to the other.
2. It may or may not have a gate.

3. It allows ions to move against their concentration gradient. **correct**

4. It allows only certain ions to come in.

5. It is polar, so charged substances such as ions can pass through the nonpolar lipid bilayer.

Explanation:

Recall

Membrane 19
085 10.0 points

Of the following, which would indicate that facilitated diffusion is taking place?

1. A substance slows as it moves down its concentration gradient.

2. A substance diffuses much faster than the physical condition allows. **correct**

3. ATP is rapidly consumed as the substance moves.

4. Substances move against the diffusion gradient.

5. A substance moves from a region of low concentration into that of higher concentration.

Explanation:

Facilitated diffusion takes place when a substance diffuses much faster than the physical condition allows.

Membrane 47

086 (part 1 of 2) 10.0 points

Five dialysis bags (synthetic membranes with pores large enough to allow glucose to pass through but not starch) with various contents are placed in beakers containing aqueous solutions. The bags are weighed before and after being placed in their respective beaker for 2 hours. The contents of the bags and the beakers are as follows:

Bag	Bag Content	Beaker content
A	10% glucose	10% glucose
B	10% glucose	water
C	40% glucose	water
D	1% starch	water
E	1% starch	10% starch

Which bag will gain the most weight after several hours in the beaker?

1. C

2. E

3. D **correct**

4. A

5. B

Explanation:

087 (part 2 of 2) 10.0 points

Which bag will lose the most weight after several hours in the beaker?

1. B

2. A

3. C

4. E **correct**

5. D

Explanation:

Circulation 46

088 10.0 points

A hemoglobin molecule has all of the following characteristics *except* that

1. binds four O₂ molecules.

2. it is composed of four polypeptide chains.

3. it is found only in humans. **correct**

4. it contains amino acids.
5. it contains iron.

Explanation:

Hemoglobin is found in many species.

Evolution of Genes 45**089 10.0 points**

Which of the following is false?

1. Hemoglobin has a higher affinity for oxygen than does myoglobin. **correct**
2. Hemoglobin and myoglobin have evolved to have somewhat different functions.
3. Oxygen has a tetrameric structure that allows it to carry more oxygen molecules than does myoglobin.
4. Myoglobin is the primary oxygen storage molecule in the muscles.
5. All of these are true

Explanation:**LifeChem 71****090 10.0 points**

Carbonic acid and sodium bicarbonate act as buffers in the blood. When a small amount of acid is added to this buffer, the H^+ ions are used up as they combine with the bicarbonate ions. When this happens, the pH of the blood

1. is reversible.
2. becomes basic.
3. ionizes.
4. becomes acidic.
5. does not change. **correct**

Explanation:**StarrC 02 14****091 10.0 points**

Which of the following statements correctly describes the action of bicarbonate, a buffer in your blood?

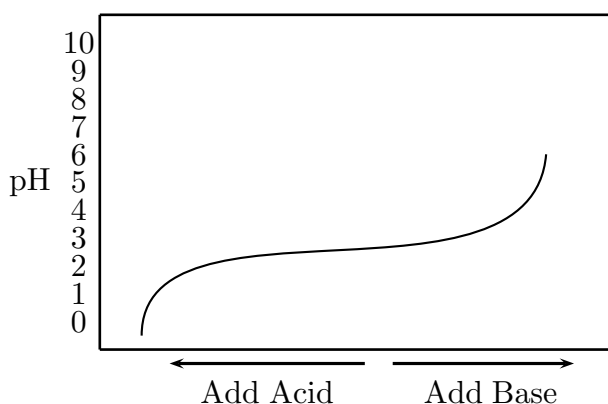
1. Bicarbonate consumes hydrogen ions when the pH is too high.
2. Bicarbonate releases hydrogen ions when blood is too acidic.
3. Bicarbonate helps to stabilize blood pH at about 5.
4. Bicarbonate combines with hydrogen ions when the pH is low. **correct**
5. Bicarbonate releases hydrogen ions when the pH is low.

Explanation:

If the blood pH is too low, there is an excess of hydrogen ions. Bicarbonate combines with these ions, increasing the pH. Bicarbonate helps stabilize blood pH at about 7.3 to 7.5.

WATER 45**092 10.0 points**

The figure below was generated by measuring the pH change in a solution buffered with acetic acid, after adding either 1 M HCl (acid) or 1 M NaOH (base).



This acetic acid buffer will be effective in maintaining pH in the range of approximately

1. from 2 to 4. **correct**
2. from 0 to 6.

3. from 3 to 10.

4. from 4 to 6.

5. from 6 to 8.

Explanation:

The pH change is drastic below 2 and above 4, so the range of pH maintained by this is 2–4.