

1. Entropy is a measure of
  - A) increase in orderliness.
  - B) gain of high-level energy.
  - C) increase in potential energy.
  - D) increase in randomness.
  - E) increase in kinetic energy.
2. In exergonic chemical reactions,
  - A) reactants have more energy than products.
  - B) energy is stored by the reactions.
  - C) reactants have less energy than products.
  - D) reactants and products possess equal amounts of energy.
  - E) Energy is consumed by the reaction.
3. The BEST description of a coupled reaction is
  - A) two reactions that occur simultaneously.
  - B) a reaction that occurs after another reaction.
  - C) two reactions that occur in the same organelle.
  - D) reactions that occur during sexual reproduction.
  - E) two reactions that involve one providing energy for the other.
4. The most common energy carrier molecule of living organisms is
  - A) ATP.
  - B) phosphate.
  - C) DNA.
  - D) glucose.
  - E) NADPH.
5. When a muscle cell demands energy to perform its work of contraction, what happens to ATP?
  - A) ATP manufactures more ATP.
  - B) ATP enters a metabolic pathway.
  - C) ATP is broken down.
  - D) ATP receives an extra phosphate.
  - E) ATP catalyzes the reaction.
6. ATP is an energy carrier. Where is the energy actually located?
  - A) attached to the phosphate group
  - B) in the bonds between phosphate groups
  - C) attached to the nucleotide
  - D) inside the phosphate
  - E) between the sugar and the phosphate
7. Most reactions in the body occur too slowly on their own to sustain life. This is because
  - A) all reactions in the body are endergonic.
  - B) many reactions require large inputs of activation energy.
  - C) no catalysts are present in body cells.
  - D) most biological catalysts are not active at body temperatures (37°C).
  - E) there is not enough ATP in body cells.
8. The reactant in an enzyme catalyzed reaction is the
  - A) substrate.
  - B) active site.
  - C) product.
  - D) inhibitor.
  - E) activation energy.
9. Why are enzymes important?
  - A) because they are proteins
  - B) because they can evade the laws of thermodynamics
  - C) because they bind to substrates
  - D) because they allow reactions to occur at body temperature
  - E) because they increase body temperature
10. Which enzyme characteristic BEST explains the fact that animals have enzymes that break apart starch molecules but not cellulose, despite the fact that both starch and cellulose are made up of glucose subunits?
  - A) Enzyme activity is regulated.
  - B) Enzymes usually speed up chemical reactions.
  - C) Enzymes are not permanently changed by the reactions they promote.
  - D) Enzymes are highly specific.
  - E) All enzymes are proteins.
11. NAD is an example of
  - A) a protein.
  - B) an electron carrier.
  - C) an enzyme.
  - D) an enzyme-substrate complex.
  - E) an active site.
12. ATP is important because:
  - A) it transfers energy from exergonic reactions to endergonic reactions
  - B) it is assembled into long chains that make up cellular membranes
  - C) it acts as an enzyme
  - D) it speeds up diffusion
  - E) All of the above
13. The first law of thermodynamics states that energy:
  - A) Equals mass times the speed of light squared
  - B) Can be created by nuclear reactions
  - C) Can not be created nor destroyed
  - D) Is slowly being depleted from the universe
  - E) Is the cause of global warming

14. What is the difference between spontaneous reactions that occur very quickly and spontaneous reactions that occur very slowly?

- A) Reactions that occur quickly release more energy
- B) Reactions that occur quickly have a smaller activation energy
- C) Reactions that occur quickly have a larger activation energy
- D) Reactions that occur quickly have smaller end products
- E) Reactions that occur quickly are part of anabolism

15. Phosphofructose kinase is an example of an allosteric enzyme. Which of the following best describes why it is considered allosteric?

- A) It converts ATP to ADP
- B) It changes shape when bound by an inhibitor
- C) It catalyzes an endergonic reaction
- D) It catalyzes a spontaneous reaction
- E) It reduces the activation energy of the reaction, thereby speeding it up

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16. Explain the mechanism by which aspirin helps relieve pain.

17. Explain how an inhibitor inactivates an enzyme?

18. Give an example that illustrates the second law of thermodynamics.