

Unit 3 Cellular Energetics AP Biology Exam Review

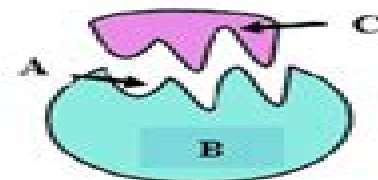
Enzyme Structure

1) To the right is an enzyme-substrate complex. Label what A, B, and C represent.

A: active site, B: enzyme, C: substrate

2) Describe how enzymes work. Make sure to include the terms products, reactants, and activation energy.

Enzymes are catalysts that speed up chemical reactions by binding to specific reactant molecules, or substrates, at their active sites. By binding to substrates, enzymes lower the activation energy required for the reaction to proceed, facilitating the conversion of reactants into products. Once the reaction is complete, enzymes release the products and can catalyze additional reactions.



Enzyme Catalysis and Environmental Effects

3) How can a scientist make an enzyme reaction increase in production rates?

A scientist can increase enzyme reaction rates by optimizing pH and temperature, increasing substrate or enzyme concentration, using cofactors, immobilizing enzymes, or genetically engineering them for improved efficiency.

4) What could slow down the creation of products from an enzymatic reaction? Give at least three items.

Factors that could slow down enzymatic reaction rates include suboptimal pH or temperature, insufficient substrate concentration, and enzyme inhibition.

5) What is denaturation? What causes this process to occur?

Denaturation is the process by which a protein, including enzymes, loses its natural shape and function due to external factors like heat, pH extremes, or chemicals. This disruption of the protein's structure prevents it from binding to its substrate and catalyzing reactions effectively.

pH Math

4) What's the concentration of a HCl solution that has a pH of 3.5?

$3.16 \times 10^{-4} \text{ M}$

Cell Energy: First and Second Law of Thermodynamics

5) Compare the first law to the second law of thermodynamics. Give examples of each.

The first law of thermodynamics, also known as the law of conservation of energy, states that energy cannot be created or destroyed, only transformed from one form to another. An example of this is the conversion of chemical energy in food into mechanical energy by muscles during exercise.

On the other hand, the second law of thermodynamics states that the entropy, or disorder, of an isolated system tends to increase over time. This law implies that spontaneous processes in a system will always lead to an increase in entropy. An example is the dissipation of heat from a hot object to its surroundings, leading to an overall increase in entropy.

$$\text{pH} = -\log[\text{H}^+]$$
$$[\text{H}^+] = 10^{-\text{pH}}$$

Modern Biology 3 Review Answers

J Rink



Modern Biology 3 Review Answers:

The Top Books of the Year Modern Biology 3 Review Answers The year 2023 has witnessed a remarkable surge in literary brilliance, with numerous engrossing novels enthralling the hearts of readers worldwide. Lets delve into the realm of bestselling books, exploring the fascinating narratives that have enthralled audiences this year. The Must-Read : Colleen Hoover "It Ends with Us" This heartfelt tale of love, loss, and resilience has captivated readers with its raw and emotional exploration of domestic abuse. Hoover expertly weaves a story of hope and healing, reminding us that even in the darkest of times, the human spirit can triumph. Modern Biology 3 Review Answers : Taylor Jenkins Reids "The Seven Husbands of Evelyn Hugo" This captivating historical fiction novel unravels the life of Evelyn Hugo, a Hollywood icon who defies expectations and societal norms to pursue her dreams. Reids captivating storytelling and compelling characters transport readers to a bygone era, immersing them in a world of glamour, ambition, and self-discovery. Discover the Magic : Delia Owens "Where the Crawdads Sing" This evocative coming-of-age story follows Kya Clark, a young woman who grows up alone in the marshes of North Carolina. Owens weaves a tale of resilience, survival, and the transformative power of nature, captivating readers with its evocative prose and mesmerizing setting. These popular novels represent just a fraction of the literary treasures that have emerged in 2023. Whether you seek tales of romance, adventure, or personal growth, the world of literature offers an abundance of engaging stories waiting to be discovered. The novel begins with Richard Papen, a bright but troubled young man, arriving at Hampden College. Richard is immediately drawn to the group of students who call themselves the Classics Club. The club is led by Henry Winter, a brilliant and charismatic young man. Henry is obsessed with Greek mythology and philosophy, and he quickly draws Richard into his world. The other members of the Classics Club are equally as fascinating. Bunny Corcoran is a wealthy and spoiled young man who is always looking for a good time. Charles Tavis is a quiet and reserved young man who is deeply in love with Henry. Camilla Macaulay is a beautiful and intelligent young woman who is drawn to the power and danger of the Classics Club. The students are all deeply in love with Morrow, and they are willing to do anything to please him. Morrow is a complex and mysterious figure, and he seems to be manipulating the students for his own purposes. As the students become more involved with Morrow, they begin to commit increasingly dangerous acts. The Secret History is a brilliant and gripping novel that will keep you guessing until the very end. The novel is a warning tale about the dangers of obsession and the power of evil.

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