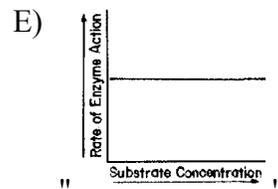
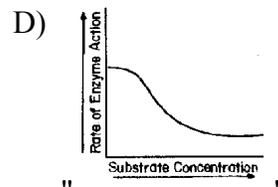
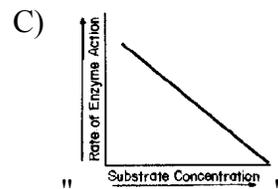
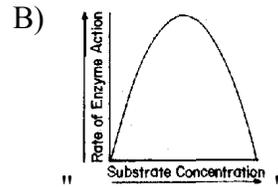
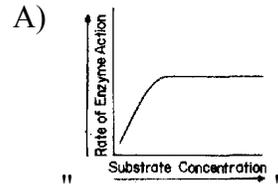


# Enzyme Control

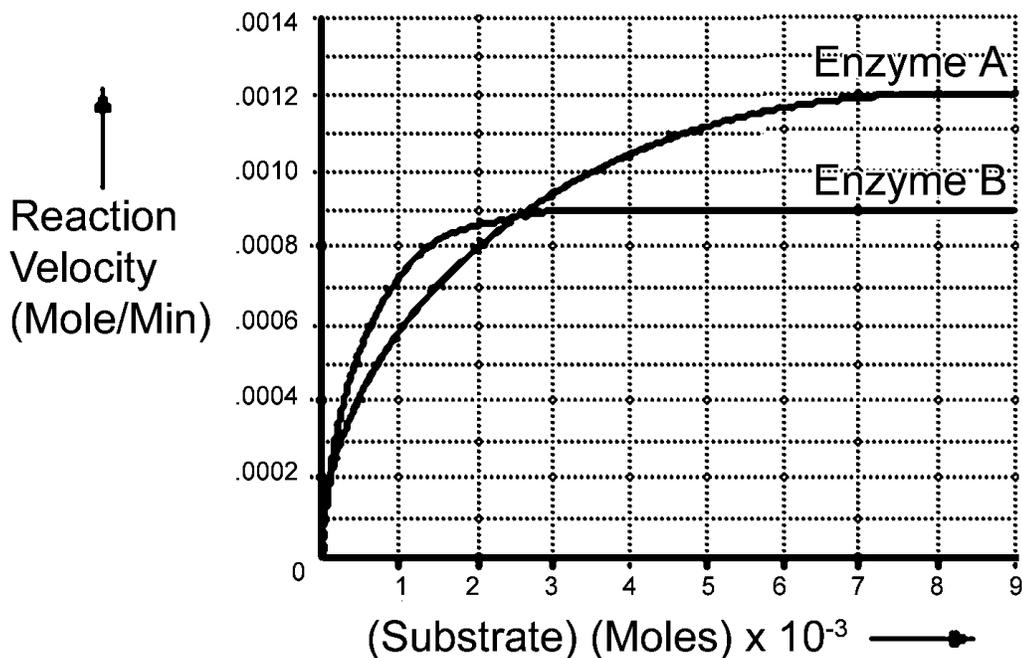
- All of the following are functions of an allosteric enzyme EXCEPT
  - the binding of a substrate may stabilize the active conformation
  - the allosteric site serves as the active site in the presence of competitive inhibitors
  - the binding of a substrate may stabilize the inactive conformation
  - they control key reactions in metabolic pathways
  - their activity changes in response to fluctuating concentrations of regulators
- When an entire enzyme population is saturated, how would the cell increase productivity?
  - Absorb more heat to denature the active site.
  - Add more enzyme.
  - Increase the substrate concentration.
  - Decrease the substrate concentration.
  - Add more active sites to the enzyme.
- The following pairs have opposite effects on enzyme function EXCEPT
  - cofactors and urea
  - decreased temperature and increased substrate concentration
  - sodium hydroxide and increased enzyme concentration
  - sulfuric acid and competitive inhibitors
  - coenzymes and repressors

4. "Which figure best depicts the relationship between substrate concentration and enzyme activity?"



5. Base your answer to the following question on the graph and information below.

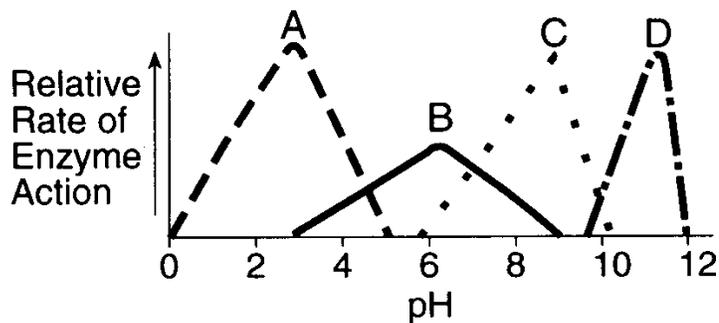
The reaction velocity was calculated for a culture containing protease and a constant excess supply of proteins starting from zero moles of substrate and is represented by the line denoting Enzyme A. A second culture was set up under the same conditions, except substance X was added and the results are indicated by the line denoting enzyme B.



Which of the following best accounts for the shape of the line for Enzyme B from the graph?

- A) The active site was changed
- B) A competitive inhibitor was introduced into the culture
- C) Substrate was removed from the culture
- D) Conformation of the enzyme has changed
- E) None of the above

- 
6. Base your answer to the following question on the graph below.



Which statement about the graph of enzyme activity is correct?

- A) All four enzymes can work together at a certain pH.
  - B) Enzyme D works best at the most acidic pH.
  - C) Enzyme D works best at the most alkaline pH.
  - D) Enzyme A works best at the most basic pH.
  - E) Each enzyme works in both acidic and basic conditions.
7. Enzymes catalyze reactions by lowering the activation energy.

(a) Explain what is meant by the "induced fit" between enzyme and substrate.

(b) Describe the two types of enzyme inhibition. Discuss one specific example explaining the positive effects of enzyme inhibition within the human body.

(c) The human digestive system uses numerous enzymes in order to catabolize food molecules. Identify one digestive enzyme and explain its function. How would the body compensate for this enzyme if it were absent?

- 
8. Cyanide is poisonous to humans because it

- A) prevents complete gas exchange in alveoli
- B) disrupts astrocyte function
- C) binds irreversibly to allosteric sites
- D) alters blood cell conformation
- E) none of the above

9. The most accepted model of enzyme function is the

- A) lock and key model
  - B) conformational hypothesis
  - C) substrate model
  - D) induced fit hypothesis
  - E) none of the above
-

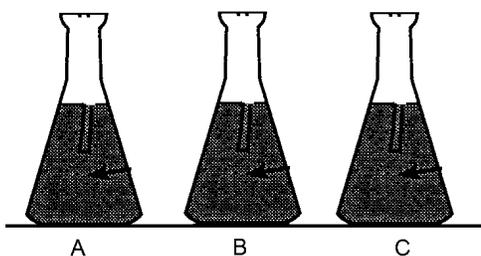
Base your answers to questions 10 through 12 on the information and diagram below.

A biologist prepares an analysis of the activity of the enzyme maltase, which promotes the hydrolysis of disaccharides to monosaccharides. Three flasks containing 10 milliliters of 4 percent maltose in water are prepared with the addition of the substances described below at time zero.

Beaker A: Addition of 0.6 ml 1% Maltase Solution

Beaker B: Addition of 0.6 ml Boiled Maltase Solution

Beaker C: Addition of 0.6 ml Distilled Water



10. After a few minutes, monosaccharides should be present in

- A) flask A only
- B) flask B only
- C) flask C only
- D) flasks A and B
- E) flasks A, B and C

11. How can the biologist find proof for enzyme denaturation by observing starch digestion in the flasks?

- A) Compare flasks A and B a few minutes after time zero.
- B) Compare flasks B and C a few minutes after time zero.
- C) Compare flasks A and C a few minutes after time zero.
- D) Compare flask A at time zero and again few minutes later.
- E) Compare flask C at time zero and again few minutes later.

12. If the object of this experiment was to test the effect of maltase on disaccharides, the control would be

- A) flask A only
- B) flask B only
- C) flask C only
- D) flask A and B
- E) flask A and C

13. E<sub>1</sub> E<sub>2</sub> E<sub>3</sub>

A → B → C → D

In the series of enzyme reactions shown above, product C is able to occupy the active site of enzyme E<sub>1</sub>. Product C can therefore inhibit the production of

- A) E<sub>1</sub>
- B) A
- C) C
- D) E<sub>2</sub>
- E) B