<Q>Which of the following statements about enzymes is INCORRECT?

<S>Y

<C>Most enzymes are proteins.

<C>Enzymes are biological catalysts.

<C>Enzymes increase the rate of reactions by lowering the free energy of activation.

<C+>Enzymes alter the equilibrium constant of the reaction they catalyze.

<Q>Which of the following statements is NOT CORRECT for an enzyme-catalyzed reaction?

<S>Y

<C>the substrate binds to the enzyme

<C+>both the substrate and product molecules are bound to the enzyme molecule

<C>the product is formed at the enzyme molecule then released

<C>product-enzyme complex is formed during the reaction

<Q>To catalyze a reaction an enzyme must:

<S>Y

<C>not alter the equilibrium constant of the reaction.

<C>not bind to its substrate.

<C>increase the activation energy of the reaction.

<C+>increase the rate of the reaction.

<Q>The rate constant for the dissociation of the ES complex to free enzyme and substrate is:

<S>Y

<C>k1

<C>k2

<C>kcat

<C+>k-1

<Q>At the beginning of an enzyme-catalyzed reaction the _____ is negligible.

<S>Y

<C>formation of ES

<C+>formation of P

<C>conversion of ES to E + S

<C>disappearance of ES

<Q>The turnover numbers of the following enzymes are: chymortypsin, 1.9x102 sec-1; carbonic anhydrase, 1x106 sec-1; acetylcholinesterase, 1.4x104 sec-1; and lysozyme 0.5 sec-1.

The most efficient enzyme of these is:

<S>Y

<C>chymortypsin

<C>acetylcholinesterase

<C>lysozyme

<C+>carbonic anhydrase

<Q>In a Lineweaver-Burk plot, one plots 1/ [S] on the X-axis vs --------- on the Y-axis:

<S>Y

<C>[S]

<C+>1/v

<C>1/Vmax

<C>1/Km

<Q>To catalyze a reaction an enzyme must :

<S>Y

<C>increase the equilibrium constant of the reaction.

<C+>bind to its substrate.

<C>increase the activation energy of the reaction.

<C>decrease the rate of the reaction.

<Q>The turnover number of an enzyme, a quantity equal to which of the following constants?

<S>Y

<C>k1

<C>k2

<C+>kcat

<C>k-1

<Q>The rate constant for the formation of E + S from the enzyme-substrate complex is:

<S>Y

<C>k1

<C>k2

<C>kcat

<C+>k-1

<Q>Which of the following relations is correct when [S] is much greater than Km ?

<S>Y

<C+>the reaction is zero order

<C>vinit is proportional to [S]

<C>vinit = ½ Vmax

<C>vinit = Vmax

<Q>Increasing temperature (T) has this effect on enzyme reactions:

<S>Y

<C>Temperature has little effect on enzyme reactions.

<C>Increasing T increases the rate of enzyme reactions over wide temperature ranges.

<C+>Increasing T increases the rate of enzyme reactions until the heat denatures the enzyme.

<C>Enzymes always work fastest at the normal T of the organism in which they are found.

<Q>Given the rate law, rate = k[A][B], the overall reaction order is

<S>Y

<C>zero

<C>one

<C+>two

<C>cannot be determined

<Q>Which of the following are related for a given enzyme?

<S>Y

<C>V max, KM, and percentage of a helix

<C>V max, k cat, and percentage of ك sheet

<C+>V max, kcat, and turnover number

<C>V max, KM, and molecular weight

<Q>In a Lineweaver-Burk plot, the y intercept equals:

<S>Y

<C>[S]

<C>km

<C+>1/Vmax

<C>1/Km

<Q>Which of the following statements about enzymes is NOT CORRECT?

<S>Y

<C>Most enzymes are globular proteins.

<C>Enzymes are biological catalysts.

<C+>Enzymes decrease the rate of the reactions they catalyze.

<C>Enzymes do not affect the equilibrium constant of the reaction they catalyze.

<Q>An enzyme-catalyzed reaction has zero order at

<S>Y

<C>[S] = 2Km

<C+>Vmax

<C>[S] << Km

<C>[S] = Km

<Q>To catalyze a reaction an enzyme must:

<S>Y

<C>not alter the equilibrium constant of the reaction.

<C>not bind to its substrate.

<C+>decrease the activation energy of the reaction.

<C>decrease the rate of the reaction.

<Q>The Michaelis constant (Km) of an enzyme catalyzed a single substrate reaction is:

<S>Y

<C>The equilibrium constant for the reaction between substrate and enzyme.

<C>It is a rate constant for the forward reaction.

<C>An index of the catalytic power of the enzyme.

<C+>A substrate concentration giving half maximum reaction velocity.

<Q>In the induced-fit model of substrate binding to enzymes

<S>Y

<C>the substrate changes its conformation to fit the active site

<C>the active site changes its conformation to fit the substrate

<C+>there is a conformational change in the enzyme when the substrate binds

<C>there is aggregation of several enzyme molecules when the substrate binds

<Q>A Lineweaver-Burk plot is useful in the analysis of enzymatic reactions because

<S>Y

<C+>it is easier to see whether points deviate from a straight line than from a curve

<C>it is not affected by the presence of inhibitors

<C>it can be used whether or not the enzyme displays Michaelis-Menten kinetics

<C>It is faster in establishing a conclusion about the reaction

<Q>The Km of hexokinase for glucose = 0.15 mM and for fructose, Km = 1.5 mM. Which is the preferred substrate?

<S>Y

<C+>Glucose.

<C>Fructose.

<C>Neither substrate is preferred over the other.

<C>You cannot tell from the data given.

<Q>The rate constant for the decomposition of the enzyme-substrate complex into enzyme and product is:

<S>Y

<C>k1

<C>k-2

<C+>k2

<C>k-1

<Q>The Michaelis constant (Km) of an enzyme-catalyzed reaction represents the dissociation constant of ES when:

<S>Y

<C>k-1 = k2

<C>k-1 = k1

<C+>k-1 >>k2

<C>k1 >>k2

<Q>At which of the following substrate concentration values will the reaction velocity, V be equal to ½ of Vmax?

<S>Y

<C+>[S] = Km

<C>[S] = 10Km

<C>[S] = ½Km

<C>[S] = 2Km

<Q>The order of enzymatic reaction at a substrate concentration much smaller than Km is:

<S>Y

<C>Zero-order.

<C+>First-order.

<C>Second-order.

<C>Third-order.

<Q>In the double reciprocal plot of data from enzyme-catalyzed reactions the slope equals:

<S>Y

<C>1/Vmax

<C>-1/Km

<C+>Km/Vmax

<C>Vmax/Km

<Q>Which of the following statements about most enzymes is INCORRECT?

<S>Y

<C>Are proteins.

<C>Are highly specific.

<C>Increase the rate of reaction.

<C+>Increase the activation energy.

<Q>The reason to rewrite the Michaelis-Menten equation (such as the Lineweaver-Burk plot) is to

<S>Y

<C>visualize reactions better.

<C>form enzyme kinetic data as a hyperbolic curve.

<C>calculate catalytic proficiency.

<C+>calculate Vmax and Km.

<Q>The Michaelis constant, Km, is equal to the _____.

<S>Y

<C>maximum velocity that any given enzyme reaction can achieve

<C>substrate concentration which gives the best enzyme assay for an enzyme reaction

<C+>substrate concentration when the rate is equal to half its maximal value

<C>maximum velocity divided by two

<Q>Which enzyme below is fastest?

<S>Y

<C>kinase, kcat = 103

<C>papain, kcat = 10

<C>carboxypeptidase, kcat = 102

<C+>catalase, kcat = 107