

Program: Biotechnology Engineering

Curriculum Scheme: Revised 2016

Examination: Third Year Semester VI

Course Code: BTC603 and Course Name: Enzyme Engineering

Time: 1 hour

Max. Marks: 50

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Note to the students:- All the Questions are compulsory and carry equal marks .

Q1.	A protein having both structural and enzymatic traits is
Option A:	Collagen
Option B:	Trypsin
Option C:	Myosin
Option D:	Actin
Q2.	With regards to the Michaelis-Menten equation, a molecule that has the effect of increasing the V_{max} of a reaction upon binding to an enzyme would be called what?
Option A:	Activator
Option B:	Uncompetitive inhibitor
Option C:	Non-competitive inhibitor
Option D:	Competitive inhibitor
Q3.	Which of the following is true concerning the induced fit model of enzyme catalysis?
Option A:	The active site can be influenced by molecules binding elsewhere on an enzyme
Option B:	The initial binding of enzyme and substrate is the most tightly bound conformation
Option C:	The induced fit must occur prior to the initial binding of enzyme and substrate in order for the reaction to proceed
Option D:	The binding of enzyme and substrate is weakest in the transition state

Q4.	Not all biological catalysts are protein enzymes. Example
Option A:	Ribosomes
Option B:	Liposomes
Option C:	Ribozymes
Option D:	Zymogens
Q5.	Which of the following will be true regarding enzymes saturated with substrate?
Option A:	At saturating levels of substrate, a competitive inhibitor will affect the reaction rate more than a non-competitive inhibitor
Option B:	An enzyme with lower K_m is more easily saturated than an enzyme with high K_m
Option C:	Any excess substrate will shift the equilibrium towards the product end of the reaction
Option D:	Increasing the substrate concentration will appreciably increase the reaction rate
Q6.	Blocking of enzyme action by blocking its active sites is
Option A:	allosteric inhibition
Option B:	feedback inhibition
Option C:	competitive inhibition
Option D:	non-competitive inhibition
Q7.	_____ assays are most convenient since they allow the rate of the reaction to be measured continuously.
Option A:	Radiometric
Option B:	Spectrophotometric
Option C:	Crystallography
Option D:	Isometric

Q8.	The Michaelis constant K_M is experimentally defined as
Option A:	the concentration at which the rate of the enzyme reaction is double V_{max}
Option B:	the concentration at which the rate of the enzyme reaction is same as V_{max}
Option C:	the concentration at which the rate of the enzyme reaction is half V_{max}
Option D:	the concentration at which the rate of the enzyme reaction is three times V_{max}
Q9.	The enzymes enterokinase helps in the conversion of
Option A:	Caseinogens into casein
Option B:	Trypsinogen into trypsin
Option C:	Pepsinogen into pepsin
Option D:	proteins into polypeptides
Q10.	Catalysts are different from enzymes in
Option A:	functional at high temperature
Option B:	not used up in reaction
Option C:	being proteinaceous
Option D:	having high rate diffusion
Q11.	Which of the following is a non linear graph
Option A:	Lineweaver–Burk plot
Option B:	Michaelis–Menten
Option C:	Eadie–Hofstee diagram
Option D:	Hanes–Woolf plot
Q12.	In _____ the two substrates (a and B) bind to the enzyme (E) at the same time to produce an EAB complex
Option A:	Ternary complex mechanism

Option B:	Ping pong mechanism
Option C:	reversible catalysis
Option D:	two way catalysis
Q13.	Some of the enzymes which are associated in converting fats to carbohydrates, are present in
Option A:	Liposomes
Option B:	golgi bodies
Option C:	Glyoxysomes
Option D:	microsomes
Q14.	Enzymes having slightly different molecules structure but performing identical activity are
Option A:	apoenzyme
Option B:	Isozyme
Option C:	holoenzyme
Option D:	Coenzyme
Q15.	Both water and glucose share an -OH that can serve as a substrate for a reaction with the terminal phosphate of ATP catalyzed by hexokinase. Glucose, however, is about a million times more reactive as a substrate than water. The best explanation is that -
Option A:	glucose has more -OH groups per molecule than does water
Option B:	the larger glucose binds better to the enzyme; it induces a conformational change in hexokinase that brings active-site amino acids into position for catalysis.
Option C:	water normally will not reach the active site because it is hydrophobic
Option D:	water and the second substrate, ATP, compete for the active site, resulting in a competitive inhibition of the enzyme
Q16.	Zymogen or proenzyme is a
Option A:	Modulator
Option B:	Vitamin

Option C:	Enzyme precursor
Option D:	Hormone
Q17.	One common example of feedback inhibition would be _____.
Option A:	Allosteric inhibition of hexokinase by glucose-6-phosphate
Option B:	Reaction between succinic dehydrogenase and succinic acid
Option C:	Cyanide and cytochrome reaction
Option D:	Sulfa drugs and folic acid synthesis in bacteria
Q18.	The first enzyme to be purified and crystallized was
Option A:	Urease
Option B:	Diastase
Option C:	Insulin
Option D:	Zymase
Q19.	Most of the members of vitamin B complex act as
Option A:	Cofactor
Option B:	Coenzyme
Option C:	Apoenzyme
Option D:	Prosthetic group
Q20.	The general mechanism is that an enzyme acts by
Option A:	Reducing the energy of activation
Option B:	Increasing the energy of activation
Option C:	Decreasing pH
Option D:	Increasing pH
Q21.	Which one of the following statements regarding enzyme inhibition is correct?

Option A:	Competitive inhibition is seen when a substrate competes with an enzyme for binding to an inhibitor protein
Option B:	Non Competitive inhibition of an enzyme can be overcome by adding large amount of substrate
Option C:	Non competitive efficiency inhibitors often bind to the enzyme irreversibly
Option D:	Competitive inhibition is seen when the substrate and the inhibitor compete for the active site on the enzyme
Q22.	The non protein part of an enzyme is known as
Option A:	Cofactor
Option B:	Coenzyme
Option C:	Apoenzyme
Option D:	Prosthetic group
Q23.	The concept of "induced fit" refers to the fact that:
Option A:	when a substrate binds to an enzyme, the enzyme induces a loss of water (desolvation) from the substrate
Option B:	substrate binding may induce a conformational change in the enzyme, which then brings catalytic groups into proper orientation
Option C:	enzyme-substrate binding induces an increase in the reaction entropy, thereby catalyzing the reaction
Option D:	enzyme specificity is induced by enzyme-substrate binding
Q24.	A transition state analog
Option A:	resembles the transition-state structure of the normal enzyme-substrate complex.
Option B:	typically yields product more rapidly with an enzyme than the normal substrate
Option C:	is less stable when binding to an enzyme than the normal substrate
Option D:	stabilizes the transition state for the normal enzyme-substrate complex

Q25.	Which of the following is a group of proteolytic enzymes?
Option A:	Bromelain and papain
Option B:	Cellulase and myrosinase
Option C:	Maltase and diastase
Option D:	Phosphatase and chlorophyllase