

Program: Biotechnology Engineering

Curriculum Scheme: Revised 2012

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.	Traditionally reversible enzyme inhibitors have been classified as competitive, uncompetitive, or non-competitive, according to their effects on
Option A:	K_m and V_{max}
Option B:	only K_m
Option C:	only V_{max}
Option D:	K_{cat}
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.	In a cell, digestive enzymes mostly occur in
Option A:	Mitochondria
Option B:	Lysosomes

Option C:	Ribosomes
Option D:	Golgi apparatus
Q17.	Irrversible inhibitors generally act by
Option A:	covalently modifying active site residues
Option B:	masking the allosteric site
Option C:	binding to whole enzyme
Option D:	masking the active site temporarily
Q18.	The favoured model for the enzyme–substrate interaction is the
Option A:	Lock and Key model
Option B:	Induced fit model
Option C:	Partial binding model
Option D:	Optimization model
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.	_____ is a graphical interface tool for building kinetic models of enzyme catalyzed reactions
Option A:	ENKN
Option B:	ENZO
Option C:	KINETIN
Option D:	ENZ
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 a 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.	_____ cleave various bonds by means other than hydrolysis and oxidation
Option A:	Isomerase
Option B:	Lyases
Option C:	Ligase
Option D:	Hydrolase
Q23.	In some enzymes, no amino acids are directly involved in catalysis; instead, the enzyme contains sites to bind and orient catalytic
Option A:	Cofactor
Option B:	Coenzyme
Option C:	Prosthetic group
Option D:	Zymogens
Q24.	_____ interactions with metabolites upstream or downstream in an enzyme's metabolic pathway cause feedback regulation
Option A:	allosteric
Option B:	active site
Option C:	substrate
Option D:	product

Q25.	The rate of a reaction is dependent on the _____ needed to form the transition state which then decays into products.
Option A:	release energy
Option B:	activation energy
Option C:	metabolic energy
Option D:	Gibbs energy

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Question	Correct Option (Enter either 'A' or 'B' or 'C' or 'D')
Q1.	C
Q2.	A
Q3.	A
Q4	C
Q5	B
Q6	C
Q7	B
Q8.	C
Q9.	B
Q10.	B
Q11.	B
Q12.	A
Q13.	C

Q14.	A
Q15.	B
Q16.	B
Q17.	A
Q18.	B
Q19.	A
Q20.	B
Q21.	D
Q22.	B
Q23.	A
Q24.	A
Q25.	B