BRAINWARE UNIVERSITY

Term End Examination 2019 - 20

Programme – Bachelor of Science Honours in Biotechnology

Course Name – Enzymology

Course Code – BBT305B

(Semester – 3)

Time allotted: 3 Hours | Full Marks: 70

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group –A

(Multiple Choice Type Question) 20 x 1 = 20

1. *Choose the correct alternative from the following* (Answer any Twenty)

(i) SI Unit for enzyme activity is

a. Bel
b. Mho
c. Cat
d. Katal

(ii) Which of the following options is correct?

a. Apoenzyme + Cofactor = Holoenzyme
b. Apoenzyme - Cofactor = Holoenzyme
c. Apoenzyme =Cofactor – Holoenzyme
d. None

(iii) Enzymes are classified into how many types

a. Two
b. Three
c. Five
d. Six

(iv) The cofactor present in Urease enzyme is

a. Co
b. MO
c. Ni^{2+}
d. K^{+}

(v) Multiple forms of an enzyme that catalyse the same reaction is known as

a. Abzyme
b. Synzyme
c. Protabzyme
d. Isozyme

(vi) A _____ is a biocatalyst that increases the rate of the reaction without being changed.

a. Aluminum oxide
b. Silicon dioxide
c. Enzyme
d. Hydrogen peroxide

(vii) Name the enzyme secreted by pancreas?

a. Pepsin
b. Chymotrypsin
c. Trypsin
d. Alcohol dehydrogenase

(viii) What is the function of phosphorylase?

a. Transfer inorganic phosphate
b. Transfer a carboxylate group
c. Use H_2O_2 as the electron acceptor
d. Transfer amino group

(ix) What is the binding energy?

a. Free energy released in the formation of enzyme-substrate interaction
b. The energy required to form a bond
c. The energy required to bind substrate
d. It is the activation energy

(x) Which of the following options is not a catalytic strategy for an enzyme to perform specific reaction?

a. Covalent catalysis
b. Metal ion catalysis
c. Michaelis constant
d. Acid-base catalysis

(xi) Name an enzyme which is not proteinaceous in nature?

a. Cellulases
b. Xylanases
c. Ribozyme
d. Peptidiase

(xii) The 'lock and key hypothesis' mechanism is related with:

a. Digestion of fat in the body
b. For enzyme specificity
c. For the formation of vacuole
d. Explosives

(xiii) An uncompetitive inhibitor of an enzyme catalyzed reaction

a. is without effect at saturating substrate concentration
b. can actually increase reaction velocity in rare cases
c. binds to the Michaelis complex and decreases Vmax
d. All of these

(xiv) Consider this reaction. A + B --> C + D + energy.

a. This reaction is exergonic
b. An enzyme could still speed the reaction
c. A and B are reactants; C and D are products
d. All of these are correct

(xv) An uncatalysed reaction requires a

a. Higher activation energy
b. Lower activation energy
c. Balanced activation energy
d. All of these

(xvi) Induced fit hypothesis was proposed by

a. Koshland
b. Charles Leibeg
c. Buchner
d. Fischer

(xvii) When the velocity of enzyme activity is plotted against substrate concentration, which of the following is obtained?

a. Hyperbolic curve
b. Parabola
c. Straight line with positive slope
d. Straight line with negative slope

(xviii) Which of the following statements is true about competitive inhibitors?

a. It is a common type of irreversible inhibition
b. In the presence of a competitive inhibitor, the Michaelis-Menten equation becomes $V_0 = \frac{V_{max}[S]}{\alpha K_m + [S]}$
c. The apparent Km decreases in the presence of inhibitor by a factor α
d. The maximum velocity for the reaction decreases in the presence of a competitive inhibitor

(xix) The rate determining step of Michaelis-Menten kinetics is

a. The complex dissociation step to produce products
b. The complex formation step
c. The product formation step
d. None of the above

(xx) The molecule which acts directly on an enzyme to lower its catalytic rate is

a. Repressor
b. Inhibitor
c. Modulator
d. Regulator

(xxi) Which of the following is an example for irreversible inhibitor?

a. Disulfiram
b. Oseltamivir
c. Protease inhibitors
d. DIPF

(xxii) Where does inhibitor binds on enzyme in mixed inhibition?

a. At active site
b. Allosteric site
c. Does not bind on enzyme
d. Binds on substrate

(xxiii) Which of the following catalyzes the reversible degradation of 2-phosphoglycerate to phosphoenolpyruvate?

a. Chymotrypsin
b. Hexokinase
c. Enolase
d. Trypsin

(xxiv) The allosteric inhibitor of an enzyme

a. Causes the enzyme to work faster
b. Binds to the active site
c. Participates in feedback regulation
d. Denatures the enzyme

(xxv) Lineweaver-Burk plot is also known as

a. Double reciprocal plot
b. Hanes-Woolf plot
c. Eadie-Hofstee plot
d. Steady-state equation

Group – B

(Short Answer Type Questions) 4 x 5 = 20

Answer any *four* from the following

2. Explain Allosteric enzyme. 5
3. Differentiate between Apoenzyme and Holoenzyme. 5
4. What is enzyme classification? Illustrate the different classes of enzyme. 2+3
5. Define enzyme activity and how it is measured? 5
6. Write a note on induced fit hypothesis. 5
7. Briefly explain the mechanism of enzyme catalysis. 5

Group – C

(Long Answer Type Questions) 3 x 10 = 30

Answer any *three* from the following

8.	(a)	Define enzymes. Explain nomenclature and IUBMB classification with suitable examples.	5
	(b)	Define enzyme inhibition. Explain in detail the different types of inhibitions with suitable examples.	5
9.	(a)	Explain factors affecting enzyme activity.	5
	(b)	What is enzyme classification? Explain nomenclature and IUBMB classification with suitable examples.	5
10.	(a)	What are catalytic strategies? Explain the different types of catalytic strategies.	2+5
	(b)	Write short notes on Km.	3
11.	(a)	Explain the Michealis constant (Km).	3
	(b)	Illustrate the significance of Km and Vmax.	7
12.	(a)	Give a brief notes on isozymes.	3
	(b)	What are allosteric enzymes?	3
	(c)	Write short notes on industrial enzymes.	4
