

Virtual University of Pakistan
Final term papers
BIO303
Biochemistry II

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bio303

Q: 1 what is half reaction?

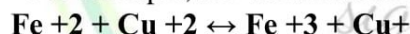
Ans.1:- Half-Reactions:

A **half reaction** is either the oxidation or reduction reaction component of a redox reaction.

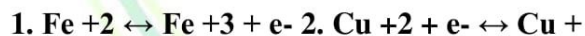
- A half reaction is obtained by considering the change in oxidation states of individual substances involved in the redox reaction.

Although oxidation and reduction occur together, we consider the two halves of an oxidation-reduction reaction separately.

- For example, the oxidation of ferrous ion by cupric ion is written as follows,



- Same can be described as 2 half reactions in the following form:



Q 2: Define pH. According to the equations on 25 degree centigrade?

Ans.2:- The **pH** of a solution is defined as the logarithm to the base 10 of the reciprocal of the $[\text{H}^+]$, i. e. the negative logarithm of the $[\text{H}^+]$

- $\text{pH} = \log 1/[\text{H}^+]$

- $= -\log[\text{H}^+]$

- The pH of water at 25°C, in which H^+ and OH^- ions are present in equal numbers, is 7.0

- $\text{pH} = -\log[1 \times 10^{-7}] = 7$

- The symbol p denotes "negative logarithm of"

- For each pH unit less than 7.0, the $[\text{H}^+]$ is increased tenfold;

- for each pH unit above 7.0, it is decreased tenfold

Q 3 : competitive inhibition?

Ans.3:- Competitive Inhibition :

- This type of inhibition occurs when the inhibitor binds reversibly to the same site that the



substrate would normally occupy i.e. active site and, therefore, competes with the substrate for that site. Reversible inhibitors bind to enzymes through non covalent bonds. • Dilution of the enzyme-inhibitor complex results in dissociation of the reversibly bound inhibitor, and recovery of enzyme activity.

Q 4: Incompetive inhibitors, how it is d/f from competitive

Ans.4:

Q 5: how enzyme defect the reaction rate?

Ans.5:

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Q6: mechanism of enzyme action, 10 marks

Ans.6: Mechanism of Enzyme Action

Enzymes bind and chemically transform other molecules— they catalyze reactions.

- The molecules acted upon by enzymes are called reaction **substrates** rather than ligands.
- Enzymes are highly effective catalysts, commonly enhancing reaction rates by a factor of 10⁵ to 10¹⁷.
- The distinguishing feature of an enzyme-catalyzed reaction is that it takes place within the confines of a pocket on the enzyme called the **active site**. • The surface of the active site is lined with **amino acid** residues with side chains that complement and bind the substrate and catalyze

its chemical transformation. • Often, the active site encloses a substrate, sequestering it completely from solution. • The enzyme substrate complex, whose existence is central to the action of enzymes. • Enzyme-catalyzed reactions have three basic steps: • binding of substrate: $E+S \leftrightarrow ES$ • conversion of bound substrate to bound product: $ES \leftrightarrow EP$ • release of product : $EP \leftrightarrow E+P$

Q 7: citric acid cycle 10 marks

Ans.7: Citric acid cycle-1

- Also called Tricarboxylic Acid Cycle (TCA) or Krebs cycle (after its discoverer, Hans Krebs). • Three names for the same thing.
- A series of chemical reactions used by all aerobic organisms to generate energy through the oxidation of acetyl CoA derived from carbohydrates, fatty acids and proteins into carbon dioxide, water and chemical energy in the form of adenosine triphosphate.

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Q.1: shape of rRna

Ans.1:-

Q.2: what is activation energy?

Ans.2: The difference between the energy levels of the ground state and the transition state is the **activation energy, G^\ddagger** .

The rate of a reaction reflects this activation energy: a higher activation energy corresponds to a slower reaction.

- Reaction rates can be increased by raising the temperature, thereby increasing the number of molecules with sufficient energy to overcome the energy barrier.
- Alternatively, the activation energy can be lowered by adding a catalyst.
- Catalysts enhance reaction rates by lowering activation energies.
- The role of enzymes is to accelerate the inter-conversion of S and P.
- i.e **enzymes lower the energy of activation, G^\ddagger , of a reaction.**

The enzyme is not used up in the process, and the equilibrium point is unaffected.

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Q.1: Biogenetics.

Ans.1: Bioenergetics is the quantitative study of the **energy transductions** changes of one form of energy into another—that occur in living cells, and of the nature and function of the chemical processes underlying these transductions.

Q.2: Ionization.

Ans.2: Ionization is the process by which an atom or a molecule acquires a negative or positive charge by gaining or losing electrons to form ions, often in conjunction with other chemical changes.

Q.3: Why pure water is pass more electrical current.

Ans.3:

Q.4: Mechanism of Enzyme activity. Explain how enzyme deficit the enzyme activity.

Ans.4:

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Competitive and noncompetitive inhibition 2 question(5+3)

Ans: Competitive Inhibition:-

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- Dilution of the enzyme-inhibitor complex results in dissociation of the reversibly bound inhibitor, and recovery of enzyme activity.

Non-competitive Inhibition:-

- Inhibitors bind enzymes at sites distinct from the substrate-binding site and • generally bear little or no structural resemblance to the substrate. Non-competitive inhibition cannot be overcome by increasing the concentration of substrate.

What are isozymes (2)

Ans: Two or more enzymes that catalyze the same reaction but are encoded by different genes are called **isozymes**

How activation energy reflects rate of reaction (2)

10 steps of citric acid cycle with the names of enzyme at each stage(10)

Note on enzyme mechanism, explain how activation energy effects rate of reaction?(10)

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Q4 : Incompetive inhibitors , how it is d/f from competitive

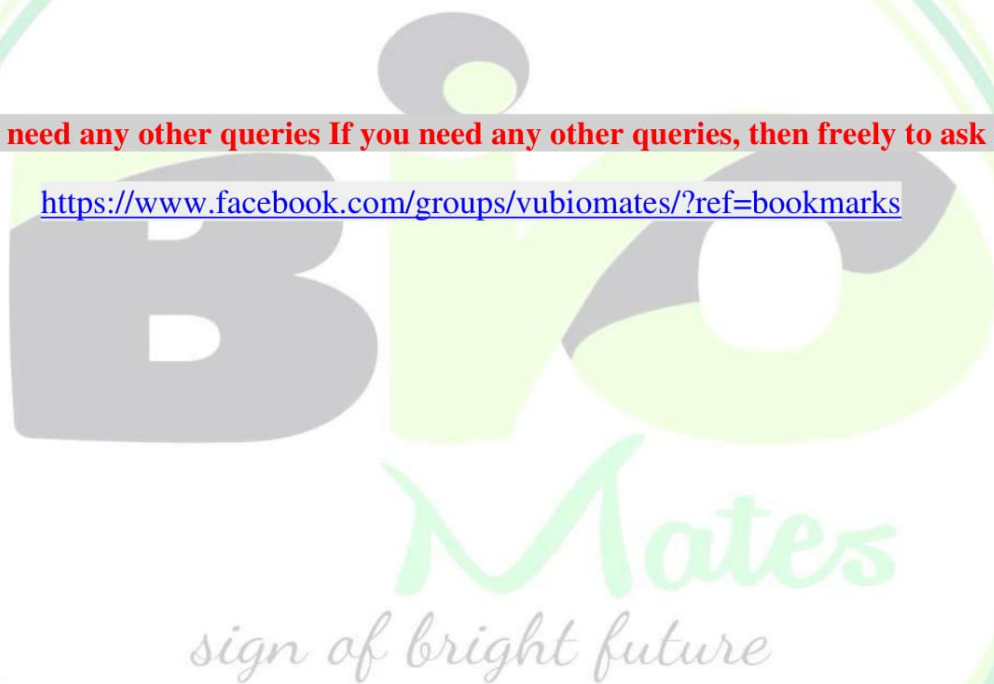
Q5 : how enzyme defict the reaction rate ,(thk se yad ni ye ques)

Q6: mechanism of enzyme action, 10 marks

Q7 : citric acid cycle 10 marks

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Created by Team VU BIO MATES

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3. Competitive inhibition ,
4. Incompetitive inhibitors , how it is d/f from competitive
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7. Citric acid cycle 10 marks
8. Shape of rRna
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10. Bioenergetics..
11. What is ionization.
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15. Why pure water is pass more electrical current.
16. What are isozymes
17. What is the activation energy reflect the rate of reaction?
18. The function of cofactor in pyruvate dehydrogenase coenzyme A?
19. Which ions are formed due to ionization of water.? and what happens to H⁺ ions?
20. what is competitive inhibitor? and explain what is effect on V_{max}?
21. The function of cofactor in pyruvate dehydrogenase coenzyme

Some solved questions:

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 $\text{Fe}^{+2} + \text{Cu}^{+2} \leftrightarrow \text{Fe}^{+3} + \text{Cu}^{+}$

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