

# Biochemistry assignment



Protein folding occurs as consequence of interactions between the side chains in their primary structure. It has several interactions that stabilize tertiary structure: Hydrophobic interactions Electrostatic interactions

Hydrogen bonds Covalent bond Question (2): Describe the process of protein denaturation. What conditions cause denaturation? The process of protein structure disruption is called denaturation; when a protein is denatured, the secondary and tertiary structures are altered but the peptide bonds of the primary structure between the amino acids are left intact.

Since all structural levels of the protein determine its function, the denatured protein can no longer perform its function once it has been denatured. The conditions that cause denaturation : Strong acid or base Organic solvents Detergents Reducing agents. Heavy metal Temperature change. Mechanical stress Question (3): Differentiate between fibrous protein and globular protein. Fibrous proteins made into threads or cables with repeating units; water-insoluble molecules that provide mechanical or structural support, e. G. A keratin and collagen.

Globular proteins Spherical; water-soluble molecules with a hydrophobic interior and hydrophobic surface; have mostly functional roles in the cell, e. G. Enzymes. Enzyme Question (4): List three important properties of enzyme. Enzymes are generally globular proteins, some are simple proteins and others are conjugated proteins. Enzymes catalyze reactions without being destroyed or chemically changed. Enzymes are usually very specific as to which reactions they catalyze and the substrates that are involved in these reactions.

Question (5): Discuss the Michaelis-Menten kinetics by plotting the graph.

What are conditions to be considered when model the reaction? Michaelis-Menten kinetics Model to investigate enzyme rates. When substrate (S) binds in the active site of enzyme (E), an intermediate complex (SE) is formed. During transition state, substrate is converted into product. Then product dissociates from enzyme. At high [S], S saturates E, and the reaction rate is independent of the [S]. The value of  $v$  under this condition is called the maximum velocity ( $V_{max}$ ).

At low [S] the reaction is . The rate equation (Michaelis-Menten equation) that describes this relationship is The concentration of substrate that corresponds to half-maximum velocity is called the Michaelis constant,  $K_m$ . The enzyme is half-saturated when  $[S] = K_m$ ; good estimate for the optimum concentration of substrate. Conditions for Michaelis-Menten Modeling Temperature, ionic strength, pH, and other physical conditions that might affect the rate must remain constant. Each enzyme can act on only one other molecule at a time.

The enzyme must remain unchanged during the course of the reaction. The concentration of substrate must be much higher than the concentration of enzyme. Question (6)' Discuss on factors that give effect to enzyme activity Temperature all proteins change shape when exposed to heat or cold and each of them has an optimal temperature range. pH all enzymes have an optimal range of pH e.g. Stomach. Concentration having more enzymes makes the reaction faster. Nucleic Acid Question (7): Compare the structural organization of DNA and RNA. Characteristic DNA RNA