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KPK Class 11 Biology Conceptual Questions – Chapter 3

Enzymes

Q1: What is a thing Cofactor? Give examples.

- A **cofactor** is a non-protein molecule or ion that is required for the proper functioning of an enzyme. It assists the enzyme in catalyzing reactions.
- **Examples** of cofactors include:
 - **Metal ions** (e.g., Zinc, Magnesium, and Iron).

- **Coenzymes** (organic molecules derived from vitamins, such as **NAD+** and **FAD**).

Q2. What are Metal Activators? Give three examples.

- **Metal activators** are metal ions that enhance the activity of enzymes.
- **Examples** of metal activators:
 - **Zinc** (activates enzymes involved in DNA replication and protein synthesis).
 - **Magnesium** (essential for ATP-related reactions).
 - **Copper** (important for electron transport chain enzymes).

Q3: Differentiate the key difference between the Lock and Key Model vs. Induced Fit Hypothesis/model?

- **Lock and Key Model:**
 - Enzyme's active site is rigid and complementary to the substrate.
 - Substrate fits precisely into the active site like a key in a lock.
 - No conformational changes occur in the enzyme.
- **Induced Fit Hypothesis:**
 - Enzyme's active site is flexible and can change shape.
 - Substrate binding induces conformational changes in the enzyme.
 - Active site adjusts to fit the substrate.
 - More widely accepted model.

Q4: How pH of a cell affects the Enzyme Activity?

- **pH** affects enzyme activity by altering the ionization state of amino acid residues in the active site.
- Each enzyme has an optimal pH range for maximum activity.
- **Acidic pH:** Can denature enzymes.
- **Alkaline pH:** Can alter enzyme structure.
- Maintaining the **optimal pH** ensures efficient enzyme function.