

## Biology - FSC Part 1 Biology English Medium Chapter 3 Preparation

Q1. Define inhibitors with example.

**Ans 1:** An inhibitor is a chemical substance that can react with the enzyme but is not transferred into the product and thus blocks the active site temporarily or permanently. For example: poisons like cyanide, antibodies, anti-metabolites, some drugs and pesticides etc.

Q2. How does high temperature affect enzyme activity?

**Ans 1:** The rate of an enzyme-controlled reaction may increase with an increase in temperature but up to a certain limit. All enzymes can work at their maximum rate at a specific temperature called optimum temperature. Heat provides activation energy and therefore chemical reactions are accelerated at high temperature.

Q3. Define optimum pH.

**Ans 1:** Every enzyme functions most efficiently over a narrow range of pH known as the optimum pH.

Q4. What are enzymes? Give their importance?

**Ans 1:** Enzymes are called biological catalysts; they tremendously increase the rate of reaction, decrease the energy of activation, and they are produced by living organisms.  
Importance: Enzymes control and catalyze chemical reactions in living bodies or cells. Without enzymes, reactions are not possible, ultimately making life impossible.

Q5. Write four characteristics of an enzyme.

**Ans 1:**

1. All enzymes are globular proteins.
2. They increase the rate of reaction without themselves being used up.
3. Their presence does not affect the nature or properties of end products.
4. Even a small amount of enzymes can bring about a change in a large amount of the substrate.

Q6. Who proposed the induced fit model of enzyme action?

**Ans 1:** Koshland's proposed induced fit model.

Q7. At high substrate level, the rate of enzyme action is not increased. Give reason.

**Ans 1:** If the enzyme concentration is kept constant and the amount of substrate is increased, a point is reached when further increase in the substrate does not increase the rate of reaction any more. This is because at high substrate level all the active sites of the enzyme are saturated with substrate.

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Q8. Discuss lock and key model of enzyme action.

**Ans 1:** Emil Fischer in 1890 proposed lock and key model to visualize enzyme substrate interaction. According to this model, only a specific key fits in a particular lock to open it. Similarly, a specific enzyme can transform only one substrate into product. According to the lock and key model, the active site is a rigid structure. There is no key modification or flexibility in the active site before, during, and after the enzyme action, and it is used only as a template.

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Q9. What is an activator?

**Ans 1:** Some enzymes use metal ions as cofactors like  $Mg^{2+}$  etc. The detachable cofactor is known as an activator if it is an inorganic ion like.

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Q10. How does an extreme change in pH affect an enzyme?

**Ans 1:** A slight change in pH can change the ionization of the amino acids at the active site. Moreover, it may affect the ionization of the substrates. Under these change conditions, enzyme activity is either retarded or blocked completely. Extreme changes in pH cause the bonds in the enzymes to break, resulting in enzyme denaturation.

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