

KPK Class 10 Biology Short Questions – Chapter 17

Biotechnology

1. Write about any four products developed through fermentation.

Answer:

Fermentation is a process where microorganisms like bacteria and yeast convert sugars into alcohol, acids, or gases. Four products developed through fermentation are:

1. Ethanol - Used in alcoholic beverages 🍷 and as a biofuel.
 2. Yogurt - Made from milk by the action of lactic acid bacteria 🥛.
 3. Bread - Yeast is used to ferment dough, causing it to rise 🍞.
 4. Antibiotics - Like penicillin, which is produced by certain molds 🍄.
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2. Name any four microorganisms used in biotechnology. Also name the process in which they are used.

Answer:

In biotechnology, various microorganisms play a crucial role in different processes:

1. Escherichia coli (E. coli) - Used in gene cloning.
 2. Saccharomyces cerevisiae (Yeast) - Used in fermentation 🍷.
 3. Lactobacillus - Used in the production of yogurt.
 4. Aspergillus niger - Used in the production of citric acid 🍷.
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3. Why are vectors used in genetic engineering?

Answer:

Vectors are DNA molecules used in genetic engineering to transfer genes from one organism to another. They help in the following ways:

- Carrying the desired gene into the host cell.
- Replicating within the host to produce multiple copies.
- Ensuring the gene is expressed in the host cell 💡.

Vectors are like vehicles that transport the genetic material to the desired location efficiently 🚗.

4. Write any five advantages of biotechnology in the field of agriculture.

Answer:

Biotechnology offers several benefits to agriculture, including:

1. Increased Crop Yield 🌾: Crops can be genetically modified to produce more food per acre.
2. Pest Resistance 🦋🚫: Crops can be engineered to resist pests, reducing the need for chemical pesticides.
3. Drought Tolerance 💧: Biotechnology can create plants that survive in dry conditions, ensuring food production during droughts.
4. Improved Nutritional Value: Crops can be enhanced to contain more vitamins and nutrients.
5. Reduced Environmental Impact 🌍: Biotechnology can help develop crops that require fewer chemical inputs, like fertilizers and pesticides.

5. How is yogurt produced through the use of biotechnology?

Answer:

Yogurt is produced through a process called fermentation. In this process:

- Lactic acid bacteria (like *Lactobacillus bulgaricus* and *Streptococcus thermophilus*) are added to milk.
- The bacteria ferment the lactose (sugar) in the milk into lactic acid.

- Lactic acid causes the milk to thicken and form the creamy texture of yogurt.
 - The acidity also gives yogurt its tangy flavor and helps preserve it.
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6. The following diagram shows how a gene is transferred to a bacterial cell. Identify the structures labeled as 1 to 5.

Answer:

In the diagram showing gene transfer to a bacterial cell, the labeled structures are:

1. Plasmid: A small, circular piece of DNA in bacteria that can carry foreign genes.
2. Donor Cell: The cell that provides the gene to be transferred.
3. Restriction Enzyme: A protein that cuts the plasmid DNA at specific sites.
4. Inserted Gene: The gene that is inserted into the plasmid.
5. Recombinant Bacterium: The bacterium that has taken up the plasmid containing the inserted gene.



EXAM KHANI