ABEHA GSA 02-01-2025

## Q No.1- (A)

Outline the theory of natural selection proposed by Charles Darwin. How does this theory explain the evolution of species.

### Answer:

**Introduction:**

Charles Darwin proposed the theory of natural selection in his book **On the Origin of Species** (1859). It explains how species evolve over time by proposing that organisms that help them survive and reproduce are more likely to pass those traits to their offspring.

**Theory of natural selection**

Following are the principles of the theory of natural selection:

- **Variation:**
  Individuals within a species exhibit variations in traits, such as size, color and behavior. These differences are often inherited.
- **Survival of the Fittest:**
  Individuals with traits that provide an advantage in their environment

are more likely to survive and reproduce

- **Overproduction**

Most species produce more offspring than can survive. This leads to competition for limited resources like food, space and mates.

- **Struggle for existence**

Due to limited resources, individuals compete to survive.

- **Inheritance and Adaptation**

Beneficial traits are passed on to offspring, becoming more common in the population over generations.

This process leads to adaptations that improve survival and may result in evolution of new species.

**Theory of natural selection and evolution of species:**

Natural selection is a mechanism of evolution. Organisms that are more adapted to their environment are more likely to survive and pass on the genes to the next generation. This process causes species to change and diverge over time.

(B)

What are the primary methods of food preservation. Describe their principles and give examples of commonly preserved foods.

Answer:

## Food Preservation:

"Food preservation is the technique to prevent food spoilage, food poisoning, and microbial contamination in food."

## Primary methods of food preservation

- **Canning**

The food contents are sealed in an airtight container at high temperatures.

**Examples:** Meat, fish and fruits are preserved by canning.

- **Sterilization:**

This method is carried out to remove microbes from food.

**Example:** Milk sterilization at 100°C kills the microbes.

- **Refrigeration and Freezing**

Low temperatures halt the growth of microorganisms and

enzymatic activity.

**Examples:** Fresh vegetables, meats, dairy products and frozen berries etc.

- **Pickling:**

It uses an acidic solution (like vinegar) or fermentation to inhibit microbial growth.

**Examples:** Pickles, kimchi, pickeled onions etc.

**Their basic principle:**

Each preservation method works by creating conditions that prevent microbial growth, slow down enzymatic reactions or remove components (like moisture or Oxygen) to prevent spoilage.