# Comprehension Questions - Module 15: Biotechnology & Evolution

## DNA Technology

1. Explain how restriction enzymes and DNA ligase are used in recombinant DNA technology.
2. Describe the process of polymerase chain reaction (PCR) and its applications.
3. Explain how gel electrophoresis separates DNA fragments and how it is used in genetic analysis.
4. Describe how DNA sequencing works and why it is important.

## Genetic Engineering

1. Explain how genetic engineering can be used to produce useful products (e.g., insulin, growth hormone).
2. Describe the process of creating transgenic organisms and discuss potential benefits and concerns.
3. How is CRISPR-Cas9 used for gene editing, and what are its potential applications?

## Genomics and Bioinformatics

1. Explain what genomics is and how it differs from traditional genetics.
2. Describe how bioinformatics tools are used to analyze genetic data.
3. How has the Human Genome Project contributed to our understanding of biology and medicine?

## Evolution Overview

1. Explain the theory of evolution by natural selection and its key components.
2. Compare and contrast the ideas of Lamarck and Darwin regarding evolution.
3. Describe the evidence for evolution from different fields of biology.

## Natural Selection

1. Explain how natural selection acts on variation in populations.
2. Describe how natural selection can lead to adaptation and speciation.
3. Give examples of natural selection in action and explain how it works.

## Population Genetics

1. Explain how genetic variation is maintained in populations.
2. Describe how the Hardy-Weinberg principle relates to evolution.
3. Explain how mutation, genetic drift, gene flow, and natural selection affect allele frequencies.