

Chapter – 9 | Biotechnology: Principles and Processes

QUIZ-01

1. Biotechnology deals with the use of:
- A. Only chemicals for production
 - B. Living organisms or enzymes to produce useful products
 - C. Only non-living materials
 - D. Physical processes only (B)

Explanation : Biotechnology uses living organisms, cells, or enzymes to develop products and processes useful to humans.

2. The two core techniques of modern biotechnology are:
- A. Fermentation and respiration
 - B. Genetic engineering and bioprocess engineering
 - C. Photosynthesis and respiration
 - D. Mutation and selection (B)

Explanation : Genetic engineering alters genetic material, while bioprocess engineering enables large-scale production under controlled conditions.

3. Restriction enzymes are also called:
- A. Molecular carriers
 - B. Molecular scissors
 - C. Molecular markers
 - D. Molecular pumps (B)

Explanation : Restriction endonucleases cut DNA at specific recognition sequences, so they are called molecular scissors.

4. The enzyme responsible for joining DNA fragments is:
- A. DNA polymerase
 - B. DNA ligase
 - C. Restriction enzyme
 - D. RNA polymerase (B)

Explanation : DNA ligase joins cut DNA fragments by forming phosphodiester bonds, producing recombinant DNA.

5. The first recombinant DNA molecule was constructed by:
- A. Watson and Crick
 - B. Cohen and Boyer
 - C. Meselson and Stahl
 - D. Fleming and Chain (B)

Explanation : Stanley Cohen and Herbert Boyer constructed the first recombinant DNA molecule in 1972.

6. The sequence from where replication of DNA starts is called:
- A. Selectable marker
 - B. Cloning site
 - C. Origin of replication
 - D. Recognition site (C)

Explanation : Origin of replication (ori) is the specific DNA sequence required for initiation of replication.

7. PCR technique uses which thermostable DNA polymerase?
- A. DNA polymerase I
 - B. Taq polymerase
 - C. RNA polymerase
 - D. Ligase (B)

Explanation : Taq polymerase, isolated from *Thermus aquaticus*, remains active at high temperatures during PCR.

8. Agarose gel electrophoresis separates DNA fragments on the basis of:
- A. Colour
 - B. Size
 - C. Shape only
 - D. Nitrogen content (B)

Explanation : Smaller DNA fragments move farther through agarose gel due to the sieving effect.

9. A common cloning vector used in *E. coli* is:
- A. Ti plasmid
 - B. pBR322
 - C. RNA plasmid
 - D. Ribosome (B)

Explanation : pBR322 is an *E. coli* cloning vector containing features like ori, selectable markers and cloning sites.

10. The process of separation and purification of the final product after biosynthesis is called:
- A. Transformation
 - B. Downstream processing
 - C. Amplification
 - D. Ligation (B)

Explanation : Downstream processing includes separation, purification, formulation and quality control of the final biotechnological product.