



UNIT II (Cloning, rDNA, PCR, Applications)



Fill in the Blanks

1. _____ enzymes cut DNA at specific sequences.
2. _____ ligase joins DNA fragments.
3. The circular DNA used in cloning is called _____.
4. The first recombinant DNA product approved was _____.
5. PCR stands for _____.

MCQs

6. Which is a cloning vector?
 - a) Plasmid
 - b) Ribosome
 - c) Protein
 - d) Lipid
7. Restriction enzymes recognize:
 - a) Proteins
 - b) Specific DNA sequences
 - c) Lipids
 - d) RNA codons
8. Recombinant insulin is produced in:
 - a) Humans
 - b) Bacteria
 - c) Viruses
 - d) Yeast
9. The first recombinant vaccine was against:
 - a) Polio
 - b) Hepatitis B
 - c) Malaria
 - d) Influenza
10. PCR was invented by:
 - a) Alexander Fleming
 - b) Kary Mullis
 - c) Watson
 - d) Crick
11. PCR requires:
 - a) DNA polymerase
 - b) RNA polymerase
 - c) Ligase
 - d) Plasmid
12. DNA ligase is obtained from:
 - a) T4 bacteriophage
 - b) E. coli
 - c) Yeast
 - d) Human cells
13. The PCR enzyme Taq polymerase is isolated from:
 - a) Thermus aquaticus
 - b) E. coli
 - c) Bacillus subtilis
 - d) Pseudomonas



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14. Recombinant interferons are used in:
- a) Cancer treatment
 - b) Vaccination
 - c) Antibiotic production
 - d) Vitamin synthesis



True / False

- 15. Cloning vectors are always viral DNA.
- 16. DNA ligase joins DNA fragments.
- 17. PCR amplifies DNA.
- 18. Recombinant insulin was first made in bacteria.
- 19. Interferons are natural antiviral proteins.



Yes / No

- 20. Can restriction enzymes create sticky ends?
- 21. Is the Hepatitis B vaccine recombinant?
- 22. Can PCR amplify RNA directly?
- 23. Is plasmid DNA circular?
- 24. Was Kary Mullis awarded the Nobel Prize for PCR?
- 25. Is insulin a recombinant product?



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Fill in the Blanks

1. Restriction
2. DNA
3. Plasmid
4. Insulin
5. Polymerase Chain Reaction

MCQs

6. a) Plasmid
7. b) Specific DNA sequences
8. b) Bacteria
9. b) Hepatitis B
10. b) Kary Mullis
11. a) DNA polymerase
12. a) T4 bacteriophage
13. a) *Thermus aquaticus*
14. a) Cancer treatment

True / False

15. False
16. True
17. True
18. True
19. True

Yes / No

20. Yes
21. Yes
22. No (needs reverse transcriptase first → RT-PCR)
23. Yes
24. Yes
25. Yes