

B.A./B.Sc. 5th Semester

BIOTECHNOLOGY

(rDNA Technology and Animal Biotechnology)

Time Allowed—3 Hours]

[Maximum Marks—75

SECTION-A

Note : Attempt ALL questions. Each question carries 1½ marks.

Answer should be brief and to the point.

1. Which was the first engineered vector ?
2. The mechanism of uptake of DNA from surrounding medium is known as _____.
3. Which enzyme is obtained from *Thermus aquaticus* ? What is role of this enzyme ?
4. Write a note on EcoRI.
5. Write a short note on alkaline phosphatases and its application in diagnosis.
6. What are the three different types of ends produced by restriction enzymes ?
7. What is electroporation ?
8. Write a short note on Monoclonal antibodies.
9. What are P elements ?
10. What is function of bioreactor ?

SECTION-B

Note : Attempt 5(five) questions by selecting **one** from each unit. Each question carries equal marks (12 marks in total). Answer to each question should not exceed 5 pages.

UNIT-1

1. Describe the different types of DNA polymerases known to occur in prokaryotic and eukaryotic cells. Discuss their relative role in DNA replication.
2. Write a note on restriction endonucleases. What are different types of restriction endonucleases ? Describe artificial restriction enzymes.

UNIT-2

3. (A) Write detailed note on *E. coli* based vectors.
(B) Write a note on Alpha Complementation principle and method for Bacterial Screening.
4. (A) What are cosmids ? Write a note on its uses. What is difference between cosmids and lambda vectors ?
(B) What are the advantages of using *E. coli* as a host system for cloning ?

UNIT-3

5. (A) Explain the steps of Southern blotting in detail with labelled diagrams.
(B) Discuss various types of PCR. Write a detailed note on its principle and applications.

6. (A) What is cDNA ? How a cDNA library can be prepared ? Describe various methods of cDNA cloning.
- (B) Write a detailed note on nucleic acid labelling (both radioactive labelling and nonradioactive labelling).

UNIT-4

7. (A) Discuss with examples how large scale culture of animal cells is conducted.
- (B) Discuss in detail any two methods of transfection along with their advantages.
8. (A) How do humans metabolize glucose ? What is role of insulin and glucagon in glucose metabolism ?
- (B) What is retrovirus ? Discuss its detailed structure. Write a note on its life cycle with well-labelled diagram.

UNIT-5

9. Discuss the production of vaccines in animal cells with examples.
10. What are stem cells ? What are their sources ? Write their applications.