

Exam. Code : 107405

Subject Code : 1851

B.Sc. Biotechnology 5th Semester

BT-1 : rDNA TECHNOLOGY—A

Time Allowed—3 Hours] [Maximum Marks—40

SECTION—A

Note :— Attempt **ALL** questions — 1 mark each.

1. How bacterial alkaline phosphatase work ?
2. Define restriction enzymes.
3. What are phagemids ?
4. Why origin of replication is important in plasmids ?
5. How calcium chloride helps in making cells competent ?
6. What factors define the transformation efficiency ?
7. What is the principle of non-radioactive labeling ?
8. How end labeling of probes is done ?

SECTION—B

Note :— Attempt *five* questions by selecting at least *one* from each unit. — 4 marks each.

UNIT—I

1. Discuss the enzymes used for blunt end sticky end ligation with their mode of action.
2. How thermostable DNA polymerases have made the PCR routinely possible ? Explain it.

UNIT—II

3. Explain the genome organization of M13.
4. In order to clone a DNA fragment of ~200 kb, which vector would be appropriate and why ?

UNIT—III

5. Among CaCl_2 and electroporation, which method is more efficient for transformation and why ? Explain it.
6. Define transfection. What kinds of reagents are used for transfection and how its efficiency can be improved ?

UNIT—IV

7. In some of the applications radioactive probes are preferred over non-radioactive probes. Why ? Explain with specific examples.
8. Discuss the advantages of non-radioactive labelling method of probes.

SECTION—C

Note :— Do any *two* questions — 6 marks each.

1. Define the functions of Polynucleotide kinase, DNase-I and Nuclease S-I and discuss their applications.
2. Explain the salient features with illustrative description of pBR322 plasmid.
3. Why hybridization of nucleic acids is central to many molecular biological techniques ? Discuss it.
4. Discuss in detail the different systems for the detection of labeled probes and their applications.