

## B.Sc. Sem.-6 (Rep) Examination

CC-307

Microbiology

October-2025

Time : 2-30 Hours]

[Max. Marks : 70

**Instructions:**

1. All questions are compulsory.
2. Figures on the right indicate marks.
3. Mention correct question number against the answer.
4. Draw figures wherever necessary.

Q.1 Describe Lambda Phage and Ti - plasmid as cloning vectors. (14)

OR

Q.1 (A) Describe the role of alkaline phosphatase in rDNA technology. (07)

(B) Prepare a brief account on prokaryotic and eukaryotic host cells for cloning. (07)

Q.2 Describe principle, methods (manual and automated) and applications of gene sequencing by Sanger's dideoxy chain termination reaction. (14)

OR

Q.2 (A) Draw a labelled diagram of Oligonucleotide-directed mutagenesis. (07)

(B) Enlist five unique applications of PCR and Southern blotting. (07)

Q.3 Explain in detail, the protocol for joining isolated DNA fragment with cloning vector. (14)

OR

Q.3 (A) Write a note on chemical synthesis of DNA. (07)

(B) Write a note on colony hybridization technique. (07)

Q.4 Explain in detail the preparation of human insulin using rDNA technology. (14)

OR

Q.4 (A) Write a note on transgenic plants resistant to microbial pathogens. (07)

(B) Describe ethical, legal and social implications of rDNA technology. (07)

Q.5 Give short and specific answers in 1-2 lines only (any seven). (14)

- 1 Give name of the restriction endonuclease whose restriction site is 5'GGATCC3'
- 2 Which type of cloning vector should be used if the insert DNA size is 40 kb?
- 3 Which three marker genes are present on YEp24?
- 4 What is high stringency?
- 5 Which two steps of a PCR cycle are non-enzymatic in nature?
- 6 Write full name of ddNTP.
- 7 What is shotgun cloning?
- 8 What is biolistic device? Give its use in rDNA technology.
- 9 Which marker gene is used in blue-white screening?
- 10 What is Dane particle?
- 11 What are phylotypes?
- 12 Mention the shape of crystalline toxin produced by *cryI* gene of *B. thuringiensis*.

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