



Fourth Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.2025

## Molecular Biology and Genetic Engineering

Time: 3 hrs.

Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.  
2. M : Marks , L: Bloom's level , C: Course outcomes.

Module – 1			M	L	C
Q.1	a.	What is Central Dogma of Molecular Biology? Explain with suitable diagram.	10	L1	CO1
	b.	Give an account of Transcription and Translation in prokaryotes.	10	L1	CO1
OR					
Q.2	a.	With a neat labelled diagram explain the process of DNA replication. Add a note on DNA damage and repair.	10	L2	CO1
	b.	Give an account of Transcription and Translation in Eukaryotes.	10	L1	CO1
Module – 2					
Q.3	a.	Explain how genes expressions are regulated in prokaryotes and eukaryotes.	10	L2	CO2
	b.	Write short notes on : i) Gene silencing                      ii) Antisense technologies	10	L2	CO2
OR					
Q.4	a.	Elaborate the process of Translation control and post-translational control.	10	L2	CO2
	b.	What is RNA interference? Explain its applications. Add a note on Ribozymes.	10	L1	CO2
Module – 3					
Q.5	a.	Cloning vectors helps in engineering the derived gene into the host. Justify the statement with proper technical procedure.	10	L4	CO3
	b.	Discuss the practical applications of i) Restriction Endo nuclease      ii) DNAs	10	L3	CO3
OR					
Q.6	a.	Write in detail the applications of cloning and expression vectors.	10	L3	CO3
	b.	Write a note on : i) Reverse transcriptase      ii) Restriction digestion based cloning.	10	L2	CO3
Module – 4					
Q.7	a.	Discuss the steps involved in the establishment of Genomic and cDNA and add a note on its applications.	10	L2	CO4
	b.	Elaborate the process follows for identification and characterization of clones.	10	L2	CO4
OR					
Q.8	a.	Explain the steps involved in the process of Gene transfer technique.	10	L2	CO4
	b.	Explain the following : i) Types of PCR      ii) Labeling of Nucleic acids.	10	L2	CO4
Module – 5					
Q.9	a.	Microbes can be engineered to produce derived product. – Justify with technical description.	10	L4	CO4
	b.	Elaborate the applications of CRISPR techniques.	10	L1	CO4
OR					
Q.10	a.	Discuss in detail principle and applications of CRISPR technology.	10	L2	CO4
	b.	Animal or Plant can be converted as Bioreactors for recombinant proteins.	10	L2	CO4