



**Gandhi Institute of Engineering and Technology University, Odisha, Gunupur
(GIET UNIVERSITY)**

M.Sc. (First Semester - Regular) Examinations, January – 2026
24MLSPC1004 – Molecular Biology and Instrumental Techniques
(Life Science)

Time: 3 hrs

Maximum: 60 Marks

(The figures in the right hand margin indicate marks)

PART – A	(2 x 5 = 10 Marks)	
Q.1. Answer <i>ALL</i> questions	CO #	Blooms Level
a. Write the difference between DNA transposons and RNA transposons	CO1	K1
b. What is a codon? What are start and stop codons?	CO2	K1
c. What is an activation of an Amino acid?	CO3	K2
d. Write any two differences between the mitochondria and the chloroplast genome?	CO4	K1
e. What is meant by DNA re-association kinetics?	CO5	K2

PART – B	(10 x 5 = 50 Marks)		
<u>Answer <i>ALL</i> the questions</u>	Marks	CO #	Blooms Level
2. a. Describe the DNA- reassociation kinetics and the importance of Cot curve analysis.	5	CO1	K1
b. Describe the structure and significance of the chloroplast genome.	5	CO1	K1
(OR)			
c. Describe the experimental evidence proving DNA as the genetic material.	5	CO1	K2
d. Compare the genome organization of prokaryotes and eukaryotes.	5	CO1	K2
3.a. Discuss the elongation and termination of replication in prokaryotes with a diagram.	5	CO2	K1
b. Explain the mechanism of RNA splicing.	5	CO2	K3
(OR)			
c. Write a short note on Mismatch repair.	5	CO2	K1
d. Write down the process of RNA editing with examples.	5	CO2	K2
4.a. Explain the regulation of the trp operon.	5	CO3	K1
b. Describe the Initiation of Translation in prokaryotes.	5	CO3	K2
(OR)			
c. Explain annealing, denaturation and extension steps in PCR.	5	CO3	K1
d. Describe the Elongation and termination of Translation in prokaryotes.	5	CO3	K1
5.a. Explain the laws of absorption of light and Beer–Lambert Law.	5	CO4	K2
b. Describe the instrumentation of a UV–Visible spectrophotometer.	5	CO4	K2
(OR)			
c. Explain in detail the principle and instrumentation of Phase contrast microscopy.	5	CO4	K1
d. Explain the principle of Fluorescence Microscopy and mention its applications.	5	CO4	K1
6.a. Explain the principle of gas chromatography.	5	CO5	K1
b. Describe the principle and application of Electron Microscopy.	5	CO5	K1
(OR)			
c. Explain the principle and instrumentation of Fluorescence spectroscopy	5	CO5	K2
d. Explain the importance of primers in PCR and the role of RT-PCR.	5	CO5	K2

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