



PG
M.Sc. Semester- IV Examination, 2026
MEDICAL LABORATORY TECHNOLOGY
PAPER: MLT 402B
(MOLECULAR MICROBIOLOGY AND GENETICS)

Full Marks: 40

Time: 2 Hours

The figures in the right-hand margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.

GROUP-A

Answer any **FOUR** questions:

2×4=8

1. What is Pridnow box?
2. Define rolling circle replication.
3. What is Shine-Dalgarno sequence?
4. What is GenBank?
5. Define open reading frame (ORF).
6. What is horizontal gene transfer?

GROUP-B

Answer any **FOUR** questions:

4×4=16

7. What is bacterial genome? Describe its organization. 1+3
8. What is conjugation? Explain the role of F factor. 1+3
9. Write a short note on missense and nonsense mutation? 2+2
10. What is FASTA? Compare FASTA with BLAST. 2+2
11. What is translation? Describe the role of ribosome. 1+3
12. What is sense (+) strand and antisense (-) strand? What are the subunits of RNA polymerase?

GROUP-C

Answer any **TWO** questions:

8×2=16

13. Explain the regulation of gene expression in bacteria using the lac operon. How do operons help bacteria adapt to their environment? 5+3
14. Define mutagenesis. What methods are used to induce mutations in bacteria? Discuss the various categories of mutations found in bacterial DNA. 2+2+4
15. Define genetic recombination. Explain homologous recombination and site-specific recombination. 2+3+3
16. What is operon? What is the role of allolactose in Lac Operon? What is diauxic growth? Write a short note on Tryptophan Operon System. 1+1+2+4

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