



Seat No. : \_\_\_\_\_

# NM-101

November-2025

B.Sc., Sem.-III

## DSC-C-BT-231 T : Biotechnology (Basic Genetics and Molecular Biology) (Major)

Time : 2:00 Hours]

[Max. Marks : 50

1. Describe in detail Laws of Mendel and its exceptions with examples. 10  
**OR**
1. (A) Describe homologous recombination and its importance in detail. 5  
(B) Write a short note on linkage maps and its significance. 5
2. Describe in detail : Process of replication in prokaryotes with a labelled diagram. 10  
**OR**
2. (A) Describe rolling circle model of replication. 5  
(B) Write a short note on melting temperature of DNA and factors affecting it. 5
3. Explain the process of prokaryotic translation in detail. 10  
**OR**
3. (A) Describe the various properties of the RNA polymerase enzyme. 5  
(B) Explain the process of termination of transcription in bacteria. 5
4. Describe the different types of mutagens and their mode of action. 10  
**OR**
4. (A) Describe the process of repair of thymine dimers using visible light. 5  
(B) Write a short note on the Ames test. 5
5. Attempt any **ten** out of **12** : 10
  - (a) What is incomplete dominance ? Give an example.
  - (b) Define “allele” and “gene”.
  - (c) Genes present in chloroplast are paternally inherited. (True/False)
  - (d) Which model of replication is used for plasmid replication ?
  - (e) Which radioisotopes were used in the Meselson and Stahl experiment ?
  - (f) What is Hyperchromicity and Hypochromicity ?
  - (g) Which antibiotic binds the ribosomes in prokaryotes ?
  - (h) What is the Wobble hypothesis ?
  - (i) Define “promoter” with an example.
  - (j) What is frameshift mutation ?
  - (k) What is an auxotrophic mutant ?
  - (l) Give an example of a disease caused by deletion.