



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

**NF-126**

**November-2025**

**B.Sc., Sem.-V (NEP)**

**DSC-C-MIC-351 T : Microbiology**

**(Molecular Biology and Genetics of Prokaryotes)**

**Time : 2:00 Hours]**

**[Max. Marks : 50**

**Instructions :** (1) All questions are compulsory.

(2) Figure on the right indicates marks.

(3) Mention correct question number against the answer.

(4) Draw figures wherever necessary.

1. Explain the molecular mechanism of DNA replication. **10**

**OR**

1. (a) What is the semi-conservative nature of DNA replication ? Explain Meselson and Stahl's experiment. **5**

1. (b) Describe the contributions of Griffith, Avery-MacLeod-McCarty experiments in establishing DNA as the hereditary material. **5**

2. Describe the elongation and termination of translation process in prokaryotes. **10**

**OR**

2. (a) Discuss the negative repressible control of tryptophan operon. **5**

2. (b) Describe initiation and elongation of transcription in prokaryotes. **5**

3. Discuss direct and indirect DNA repair mechanisms in bacteria with their biological significance. **10**

**OR**

3. (a) Explain the experimental proof for the spontaneous nature of mutations given by Joshua and Esther Lederberg. **5**

3. (b) What are transposable elements ? Describe their properties and explain the roles of *Tn* elements in transposon mutagenesis. **5**

4. Define Conjugation and explain  $F^+ \times F^-$  Mating and Hfr Conjugation in detail. **10**

**OR**

4. (a) Discuss natural transformation and DNA uptake system in Gram +ve bacteria. **5**

4. (b) Explain Specialized transduction as gene transfer mechanisms in bacteria. **5**

5. Give short and specific answers in **1-2** lines only : (any **10** out of **12**) **10**

(1) Define Nucleoid.

(2) What is Replisome ?

(3) Define Plasmid.

(4) What is “wobble phenomenon” ?

(5) Define Intron and Exon.

(6) What do you mean by Degeneracy of genetic code ?

(7) Define Nonsense mutation.

(8) What is conditional mutant ? Give one example.

(9) Give any one example of Chemical mutagen.

(10) Define Merozygote.

(11) What is competency of a cell ?

(12) What do you mean by Allele ?

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