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**M.Sc. (Semester-I) Examination,
Dec.-Jan. (2025-26)**

**MICROBIOLOGY
(Molecular Biology)**

Time Allowed : Three Hours

Maximum Marks : 70

Note : This question paper is divided into four sections. Attempt questions of all four sections as per given direction. Distribution of marks is given in each section.

SECTION-A

(Objective Type Questions)

Note : Attempt **any ten** questions. Each question carries 1 mark. [10x1=10]

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(1)

[P.T.O.]



1. (i) Who described the structure of DNA double helix?

- (a) Peter Mitchell
- (b) Andre Jagendorf
- (c) Ernest Uribe
- (d) Watson and Crick

(ii) Name the protein which is used for termination of replication :

- (a) DnaC
- (b) SSB
- (c) Tus protein
- (d) DNA polymerase

(iii) Name the site where upstream sequence located :

- (a) Prior to start point

(b) After the start point

(c) Right border of DNA

(d) In the middle of DNA

(iv) A codon contains how many nucleotides?

- (a) 1
- (b) 2
- (c) 3
- (d) 4

(v) The inducer of lac operon is :

- (a) Beta-galactosidase
- (b) Galactose
- (c) Lactose
- (d) Glucose

(vi) Which protein mentioned below can reverse the central dogma?

- (a) Ribosome
- (b) Restriction Endonuclease
- (c) Reverse Transcriptase
- (d) RNA polymerase

Fill in the blanks :

- (vii) The enzyme used in light repair to split thymine dimers is called _____.
- (viii) The enzyme responsible for the removal of supercoiling in replicating DNA ahead of the replication fork is _____.
- (ix) In both the eukaryotic cell and prokaryotic cell, the synthesis of protein chains is started with the _____.
- (x) Molecular chaperones are _____.

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(4)

(xi) The trp operon in bacteria is responsible for the biosynthesis of _____.

(xii) _____ is the first enzyme in capping.

SECTION-B

(Very Short Answer Type Questions)

Note : Attempt any five questions. Each question carries 2 marks. (Word limit : 25-30 words) [5×2=10]

2. (i) Define Replication.
- (ii) What is Transcription?
- (iii) Define C-value.
- (iv) Define Chaperones.
- (v) What is Operon?
- (vi) Explain Genetic Code.
- (vii) Explain polyadenylation.

SECTION-C

(Short Answer Type Questions)

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(5)

[P.T.O.]



Note : Attempt **any five** questions. Each question carries **4** marks. (Word limit : **250** words) [5×4=20]

3. (i) Explain Mutation.
- (ii) Explain structure of DNA.
- (iii) Explain mechanism of DNA repair.
- (iv) Explain sigma factor cycle.
- (v) Explain inhibitors of translation.
- (vi) Explain trp operon.
- (vii) Explain the function of RNA polymerase.

SECTION -D

(Long Answer Type Questions)

Note : Attempt **any three** questions. Each question carries **10** marks. (word limit : **500** words) [3×10=30]

4. (i) Describe organization of microbial genomes in detail.
- (ii) Describe mechanism of DNA replication in detail.

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(6)

- (iii) Describe mechanism of translation in prokaryotes.
- (iv) Describe regulation of gene expression in detail.

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(7)

