

(6 pages)

Reg. No. :

Code No. : 10886 E Sub. Code : EMMI 31

B.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2024.

Third Semester

Microbiology — Core

MOLECULAR BIOLOGY AND MICROBIAL
GENETICS

(For those who joined in July 2023 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. The bond between the bases and the sugars in DNA referred as _____.
(a) hydrogen bond
(b) glycosylic bond
(c) phosphodiester bond
(d) covalent linkage

2. Enzymes that regulate the process of supercoiling termed as _____.
(a) DNA helicases (b) Topoisomerases
(c) Nucleases (d) DNA polymerases
3. The major protein components of chromatin referred as _____.
(a) Histones
(b) Histones like proteins
(c) RNA polymerases proteins
(d) Transcriptional factors proteins
4. In eukaryotes, _____.
(a) transcription takes place in the nucleus
(b) translation expression in the cytoplasm
(c) the messenger RNAs are consequently longer lived
(d) all of the above
5. Addition or deletion of bases causes of _____ mutation.
(a) Transversion
(b) Frame shift mutation
(c) Transition
(d) Transcription

6. The enzyme photolyase is used in _____ method of repair.
- (a) Base excision,
 (b) Photo reactivation
 (c) Nucleotide excision
 (d) None of the above
7. Ti plasmids are _____ plasmids.
- (a) Tumor inducing (b) Degradation
 (c) High copy number (d) Mammalian
8. The cycle which is completed quickly in the infection by a phage is _____.
- (a) Lysogenic (b) Lytic
 (c) Replication (d) Capsid formation
9. Name the process involves transferring naked DNA fragments between bacteria
- (a) Vectoring (b) Transformation
 (c) Transduction (d) Conjugation
10. Transposable elements is also known as _____.
- (a) Jumping genes (b) Mobile genes
 (c) Transposons (d) All the above

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PART B — (5 × 5 = 25 marks)

Answer ALL the questions, choosing either (a) or (b).
 Each answer should not exceed 250 words.

11. (a) Describe the DNA organization in prokaryotes.

Or

- (b) Examine the rolling circle mechanism of DNA replication.

12. (a) Select the salient features of RNA polymerase and its types.

Or

- (b) Illustrate the structure of the ribosomes in a prokaryotic cell.

13. (a) Write the differences between physical and chemical mutagens.

Or

- (b) Interpret the photoreactivation DNA repair mechanism.

14. (a) Categorize the various stages of plasmid DNA replication.

Or

- (b) Explain the structure of Lambda bacteriophage.

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[P.T.O.]

15. (a) Appraise the mechanisms of transposition in bacteria.

Or

- (b) Select the mechanism of specialized transduction process.

PART C — (5 × 8 = 40 marks)

Answer ALL the questions, choosing either (a) or (b).
Each answer should not exceed 600 words.

16. (a) Examine the mechanism DNA replication in *E. coli* cells.

Or

- (b) Describe the DNA supercoiling and its importance.

17. (a) Illustrate the process of transcription in eukaryotes.

Or

- (b) Explain the mechanism of translation process in prokaryotes.

18. (a) Interpret the chromosomal mutation and its types.

Or

- (b) Predict the enzymes and steps involved in excision repair.

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19. (a) Select the characteristic of bacterial plasmid and its types.

Or

- (b) Illustrate the steps involved in lysogenic life cycle of bacteriophages.

20. (a) Summarize the transformation mechanism of gene transfer in prokaryotes.

Or

- (b) Assess the structure and functions of different types of bacterial transposons.

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