

B.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2023.

Fourth Semester
Microbiology – Core

MOLECULAR BIOLOGY AND MICROBIAL
GENETICS

(For those who joined in July 2021 – 2022)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. The functions of promoter are _____.
 (a) recognition binding site for RNA polymerase
 (b) functions strictly to orient RNA polymerase a specific distance
 (c) regulating when and where a gene will be transcribed or expressed
 (d) all the above

2. The replication of a circular chromosome is complete the two circular daughter chromosomes may remain intertwined and are called.
 (a) Catenanes (b) Twin DNA
 (c) Chromids (d) Pro-chromosomes
3. The things required in order for DNA polymerases to catalyze the synthesis of a complementary strand of DNA are _____.
 (a) Template (5' to 3')
 (b) Primer (RNA or DNA strand)
 (c) dNTPs
 (d) All the above
4. The anabolic operon is _____.
 (a) Lac (b) Ara
 (c) Trp (d) Phe
5. A direct detection method for isolation of auxotrophic mutant is _____.
 (a) MPN (b) Replica plating
 (c) Ames test (d) All the above

6. Repair of Thymine dimers by splitting them with the help of visible light is known as _____.
 (a) Proofreading by replication
 (b) Excision repair
 (c) Photoreactivation
 (d) Mismatch repair
7. The possible way through which a plasmid can replicate is _____.
 (a) using cell's own replicative enzymes
 (b) carry genes that code for special replicative enzymes
 (c) replicate by inserting themselves into a bacterial chromosome
 (d) carry genes that code enzymes
8. The following is the smallest plasmid and an ideal cloning vector
 (a) ColE1 (b) RP4
 (c) PuC8 (d) F2
9. F _____ cells in bacterial conjugation.
 (a) act as recipients (b) act as donors
 (c) act as genotypes (d) act as phenotypes

10. The process of gene transformation from one independent mature organism to another is known as _____.
 (a) Replicative recombination
 (b) Site specific recombination
 (c) General recombination
 (d) Horizontal gene transfer

PART B — (5 × 5 = 25 marks)

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

11. (a) Define chromosomes and explain its functions.
 Or
 (b) Differentiate between nucleus and nucleoid.
12. (a) Discuss about the main components of trp operon.
 Or
 (b) Discuss about the function of eukaryotic gene.
13. (a) Focus on the properties of mutagens.
 Or
 (b) Describe about deletion mutation and its mechanism.

14. (a) Discuss about influenza virus genome.

Or

(b) Summarize the uniqueness about the T7 virus replication cycle.

15. (a) Discuss about the mechanism of Hfr.

Or

(b) Focus on the F factor principles.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b)

Each answer should not exceed 600 words.

16. (a) Write a detail note on rolling circle mode of replication.

Or

(b) Discuss the types and functions of RNA.

17. (a) Explain in detail about lac operon.

Or

(b) Discuss about post transcriptional modifications.

18. (a) Describe in detail about auxotrophic mutant.

Or

(b) Discuss in detail about reversion and suppression mutations.

19. (a) Focus on the types of bacterial transposons.

Or

(b) Write a detail note on Polio virus genome.

20. (a) Discuss in detail about generalized transduction.

Or

(b) Define conjugation briefly explain about Bacterial conjugation.
