19MBP07

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION DECEMBER 2022
(Second Semester)

Branch – **APPLIED MICROBIOLOGY**

MICROBIAL GENETICS

Time: Three Hours Maximum: 50 Marks

SECTION-A (5 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks (5 x 1 = 5)

1 Linkage map is based on the frequencies of _____ between markers during crossover of homologous chromosomes.
(i) Recombination (ii) Insertion
(iii) Deletion (iv) Duplication

2 Replica plating is used for the isolation of _____ mutants.
(i) Myxotrophic (ii) Autotrophic
(iii) Heterotrophic (iv) Auxotrophic

3 A bacterium with conjugative plasmid integrated in to it's chromosomal DNA is called
(i) Mobilizable plasmid (ii) Transposon
(iii) Retroposon (iv) Hfr strain

4 Helitrons are which group of bacterial transposons?
(i) Class I (ii) Class II
(iii) Class III (iv) Class IV

5 During infection by λ phage which enzyme introduces negative supercoils?
(i) DNA Polymerase (ii) DNA Gyrase
(iii) Lygase (iv) Reverse transcriptase

SECTION - B (15 Marks)
Answer **ALL** Questions
ALL Questions Carry **EQUAL** Marks
(5 x 3 = 15)

6 a Illustrate in detail about the Mendel's law of Independent Assortment with suitable example.
OR
b Discuss in detail about the complementation test and it's uses.

7 a Evaluate in brief about the process of site directed mutagenesis with it's types and applications.
OR
b Explain the process of mutation by insertion, inversion and deletion.

8 a Explain the process of Gene transfer by conjugation with suitable diagram.
OR
b Elucidate in detail about the process of Generalized and specialized transduction.

9 a Illustrate in detail about the types and functions of Transposons.
OR
b Evaluate the structure and functions of yeast TY-1 transposon.

Cont...

10 a What is Neurospora? Explain it's characteristics and mutants.

OR

b What is meant by Tetrad analysis? Explain the process with suitable example.

SECTION -C (30 Marks)

Answer **ALL** questions
ALL questions carry **EQUAL** Marks (5 x 6 = 30)

11 a Analyze the process of crossing over with suitable diagram and add a note on it's consequences.

OR

b Explain in detail about the following :
(i) Genomic imprinting
(ii) Phenocopy

12 a Elucidate the various Repair mechanism of DNA with a neat sketch and add a note on it's advantages.

OR

b Evaluate the process of various types of damage to DNA caused by physical and chemical agents.

13 a What is meant by Recombination?Explain the various models with suitable diagram and add a note on it's advantages.

OR

b Analyze in detail the role of various proteins involved in Recombination.

14 a What is meant by Transposition? Explain with a neat sketch about the mechanism of Transposition.

OR

b Elucidate the process of regulation and effects of Transposition in bacteria.

15 a What are molecular markers? Elucidate the role of markers in Gene mapping.

OR

b Enumerate in detail about the life cycle and genetic regulation of M13 phage.

Z-Z-Z END