

M.Sc. MICROBIOLOGY
SECOND SEMESTER
MICROBIAL GENETICS
MMB-205

**SET
A**

[USE OMR SHEET FOR OBJECTIVE PART]

Duration: 1hr. 30 mins.

Full Marks: 35

Time: 15 mins.

(Objective)

Marks: 10

Choose the correct answer from the following:

1 × 10 = 10

- The transfer of genes from one cell to another by a bacteriophage is known as:
 - Recombination
 - Conjugation
 - Transduction
 - Transformation
- The cell in which the F factor carries along with it some chromosomal genes are known as.....
 - F+ cell
 - F- cell
 - F' cell
 - F'' cell
- The transfer of naked DNA from one cell to another is referred to as.....
 - Transduction
 - Lysogeny
 - Transformation
 - Conjugation
- The ability of bacteria to uptake the host DNA from the environment is known as:
 - Competent cell
 - Plasmid
 - Transformed cell
 - None
- Which one is not true about plasmid?
 - Extrachromosomal genetic material
 - dsDNA
 - Replication depends on host
 - All are true
- The number of molecules of an individual plasmid that are normally found in a single bacterial cell is known as:
 - Conjugative ability
 - Replicative ability
 - Copy number
 - All of the above
- Where is Ter site located and what is the importance?
 - Next to Ori and initiates replication
 - Opposite to Ori and initiates replication
 - Opposite to Ori and terminates replication
 - Both a and b
- Which of the following is true for a cross between Hfr and F-?
 - Frequency of recombination is high, transfer of F factor is low
 - Frequency of recombination is high, transfer of F factor is high
 - Frequency of recombination is low, transfer of F factor is low
 - Frequency of recombination is low, transfer of F factor is high
- Which of the following things was identified as the transforming principle?
 - RNA
 - DNA
 - Proteins
 - All of the above

10. When viral genome can become integrated into the bacterial genome they are known as:
- a. Temperate phage
 - b. Bacteriophage
 - c. Virus
 - d. Prophage

(Descriptive)

Time : 1 hr. 15 mins.

Marks : 25

[Answer question no.1 & any two (2) from the rest]

1. What is mutation? What are the important features for a stable mutation? Justify your answer. Write in brief about spontaneous mutation. 1+2+2=5

2. Define Competent cell. Describe the mechanism of transformation with a neat diagram. 10
A transformation experiment is carried out using donor that is A+B+C+ and the recipient is A-B-C-. B+ transformation is selected. Of these 18% are C+ and none A+. C+ transformation is also selected where 10% is A+ What is gene order

3. Define plasmids. Explain the structure and features of Ti plasmids with a suitable diagram. Explain the replication process that helps in the movement of DNA from F+ to F-. Draw a suitable diagram. Explain in your language about plasmid incompatibility. 1+3+2+3=10

4. What is the difference between F+ plasmid and hfr? Explain the method of transfer of F plasmid to a recipient bacterium. Draw a suitable diagram. What is a copy number and how is it regulated? Explain. 2+4+4=10

5. a) Explain the mechanism of Transduction with a neat diagram. 1+2+4+3=10
b) Describe Hfr Conjugation with a neat diagram. Draw a diagram stating the transfer of amino Acid from F+ to F- cell.
i) Methionine: 20 min
ii) Lysine: 5 min
iii) Tryptophan: 12 min
iv) Tyrosine: 10 min

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