

M.Sc. BIOTECHNOLOGY
SECOND SEMESTER
MICROBIAL GENETICS
MBT-205

[USE OMR SHEET FOR OBJECTIVE PART]

Duration: 1hr. 30 mins.

Full Marks: 35

Time: 15 mins.

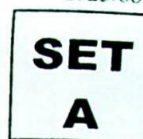
Marks: 10

(Objective)

1×10=10

Choose the correct answer from the following:

- Which of the following chemical mutagen affects only replicating DNA?
 - Acridine dye
 - Alkylating agent
 - Deaminating agent
 - Base analog
- The transfer of naked DNA from one cell to another is referred to as.....
 - Transduction
 - Lysogeny
 - Transformation
 - Conjugation
- 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
- Damage and errors in DNA cause.....
 - Mutation
 - DNA repair
 - Translation
 - Transcription
- How can conjugative and non-conjugative plasmids be differentiated?
 - On the basis of size
 - Presence of antibiotic resistance
 - Number of cloning and digestion sites
 - Presence of transfer genes
- Which of the following is an example of head-and-tail bacteriophage?
 - M13
 - Lambda phage
 - Pbr322
 - M16
- Which is a reason of instability of phage DNA molecule in the host cell in a lytic cycle?
 - The huge size of phage DNA
 - Inability of replicative enzymes
 - Immediate synthesis of capsid
 - Lytic cycle inefficiency
- Which of the following is NOT true for loss of function mutation?
 - Usually recessive
 - Most common mutation
 - Increases the activity of the gene
 - Null allelic mutation
- How many restriction sites plasmids may contain?
 - 1
 - 2
 - 3
 - More than 1



10. Which infection cycle is characterized by retention of the phage DNA molecule in the host bacterium for many thousands of cell division?
- a. Lysogenic cycle
 - b. Lytic cycle
 - c. Integrative phase
 - d. Protein synthesis

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(Descriptive)

Time : 1 hr. 15 mins.

Marks : 25

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

1. Explain the mechanism of specialized Transduction with a neat diagram. Explain with reference to LFT & HFT lysates. 5

2. Describe HFR conjugation with a neat diagram. 5+5=10
Genetic distance is determined by comparing their times of entry during an interrupted mating experiment. LAC Z and Gal E entered at 16 min and 25 min respectively. Find out the difference of time in entry with a neat diagram.

3. How can you define plasmids? What is the role of plasmids in bacteria? Explain in your own words. Explain the modes of plasmid replication in bacteria. Which one do you think takes place during the transfer of plasmid to other bacterial cells? 1+2+5+2=10

4. Explain the mechanism of induced mutation with reference to base analog. Explain Ames Test with a neat diagram. 5+5=10

5. What is the importance of plasmids to a bacterium? What is the importance of Ti plasmid to bacteria? Explain the organization of Ti plasmid. How many copy number/s are usually maintained for F plasmid? What is the importance and organization of F plasmid? What is linear plasmid and how it is different from other plasmids? 2+1+2+1+3+1=10

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