

(i) Printed Pages : 3

Roll No. ....

(ii) Questions : 9

Sub. Code : 

1	1	8	1	8
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Exam. Code : 

5	0	1	3
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Bachelor of Science (FYUP) 3rd Semester  
(2125)

**MICROBIOLOGY**

Paper : Microbial Genetics And Molecular Biology  
(Common With B.Sc. Biotechnology 3rd Sem.)

Time Allowed : Three Hours]

[Maximum Marks : 67

Note :— (1) Attempt *five* questions in total.

(2) Question No. 1 is compulsory.

(3) Attempt *one* question each from Unit (I, II, III, IV)  
from the remaining questions.

1. Attempt all parts (Compulsory) :

(a) Define the C-value Paradox.

(b) What is the function of reverse transcriptase?

(c) Differentiate between a spontaneous and an induced mutation.

(d) Name and describe the characteristics of two types of plasmids based on their function.

(e) Mention the difference between BAC and YAC.  $3 \times 5 = 15$

## UNIT—I

2. (a) Describe the Meselson and Stahl experiment. How did it prove the semi-conservative mode of DNA replication? 6
- (b) Describe the replication in *E.coli* and the enzymes involved in it. 7
3. Explain the process of transcription in prokaryotes, detailing the role of RNA polymerase in initiation, elongation, and termination. 13

## UNIT—II

4. (a) What are conditional lethal mutations? Explain how they can be used for the selection of bacterial mutants. 7
- (b) Describe the replica plating method for selection of mutants. 6
5. Describe the various mechanisms of DNA repair in bacteria. Differentiate between light-dependent and dark repair (excision repair). 13

## UNIT—III

6. (a) With the help of suitable diagrams, explain the process of transduction in bacteria. 8
- (b) Differentiate between generalized and specialized transduction. 5

7. Discuss the advantages, limitations, and applications of using yeast as a host for the production of recombinant proteins. 13

#### UNIT—IV

8. (a) Describe the principle and steps involved in a standard Polymerase Chain Reaction (PCR). Which can affect the PCR reaction? 8
- (b) List any five of its applications. 5
9. What is a genomic library? Briefly explain the steps involved in its construction and selection of clones. 13