

(i) Printed Pages : 3

Roll No. ....

(ii) Questions : 9

Sub. Code : 

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Exam. Code : 

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**B.Sc. (Hons.) Biotechnology 5<sup>th</sup> Semester**

**(2125)**

**MOLECULAR BIOLOGY**

**Paper : BIOT-501-T**

**Time Allowed : Three Hours]**

**[Maximum Marks : 67**

**Note :—** Attempt five questions in all by selecting **one** question from each unit. Question No.1 is compulsory.

1. Write in brief:

1. Structure and importance of single stranded DNA. 2

2. What are replicons? How many replicons are present in prokaryotes and eukaryotes? 2

3. Role of N-formyl-methionyl-tRNA. 2

4. What are Ter regions? 2

5. What is Pribnow box? 2

6. Role of enhancer. 2

7. What is an Operon and where is it found? 3

## UNIT—I

2. a. Describe the structure and function of Z and D-DNA. . . 7  
b. How is prokaryotic genome different from eukaryotic genome? 6
3. a. Discuss the structure and composition of Eukaryotic and Prokaryotic RNA. 6  
b. What are repetitive sequences and their types? What are VNTRs and STRs? 7

## UNIT—II

4. a. Mention from where does replication start in Prokaryotes. Which accessory factors and proteins are required for initiation of replication? 7  
b. Discuss the replication of M13 viral DNA. 6
5. a. Discuss the disassembly and assembly of chromatin during eukaryotic replication. Why is this process required during replication? 8  
b. Describe the different DNA polymerases in eukaryotes. 5

## UNIT—III

6. a. How does rRNA and mRNA of prokaryotes differ from rRNA and mRNA of eukaryotes? Explain why do they vary from each other. 7  
b. Explain with examples how is gene expression regulated in prokaryotes. 6

7. a. Which regulatory elements are responsible for gene regulation of prokaryotes during transcription? 7
- b. Mention the difference between initiation of transcription in prokaryotes and eukaryotes. 6

#### UNIT—IV

8. a. Explain how the Tryptophan-operon is regulated under various environmental factors. 8
- b. Discuss the various characteristics of genetic codons. Why does degeneracy of codons exist? 5
9. a. Describe the initiation and elongation process of translation in prokaryotes. 7
- b. Explain the structural configuration of *Lac operon* and how does it regulate gene. 6