

Roll No. : .....

Total No. of Questions : **16** ]

[ Total No. of Printed Pages : **3**

# **MICRSEM-140**

**M.Sc. (Ist Semester) Examination Dec., 2022**

## **MICROBIOLOGY**

Paper - MB-103

**(Molecular Biology)**

*Time : 3 Hours ]*

*[ Maximum Marks : 40*

The question paper contains three Sections.

### **Section-A**

**(Marks : 1 × 10 = 10)**

*Note :-* The candidate is required to answer all the *ten* questions carries **1** mark each. The answer should not exceed **50** words.

### **Section-B**

**(Marks : 3 × 5 = 15)**

*Note :-* The candidate is required to answer *five* questions by selecting at least *one* question from each Unit. Each question carries **3** marks. Answer should not exceed **200** words.

### **Section-C**

**(Marks : 5 × 3 = 15)**

*Note :-* The candidate is required to answer *three* questions by selecting at least *one* question from each Unit. Each question carries **5** marks. The answer should not exceed **500** words.

**BRI-40**

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**MICRSEM-140** P.T.O.

### Section–A

1. (i) What do you mean by Chargaff's rules ?
- (ii) What are topological properties ?
- (iii) A circular DNA has 3675 base pairs. If the base pairs per unit turn is 10.5, calculate the linking numbers of the DNA.
- (iv) What does the capacity of a short segment of DNA to move from one place to another is called ?
- (v) Name *three* Stop Codons.
- (vi) Which unit of the RNA polymerase is responsible for its proper binding at the promoter site ?
- (vii) What do you mean by *t*RNA Charging ?
- (viii) What are Housekeeping Genes ?
- (ix) What do you mean by Stringent Responses ?
- (x) What are the functions of  $\beta$ -Galactosidase ?

### Section–B

#### Unit–I

2. Write a brief note on Homologous and non-Homologous DNA recombination.
3. Explain characteristic features of A DNA.
4. What are Insertion Elements ? Write a short note.

#### Unit–II

5. What do you mean by Transcription ? Explain the structure of RNA polymerase.
6. Write a note on genetic codes and their properties.
7. Explain the makeup of ribosomes. Write a note on their role in translation.

### **Unit-III**

8. Write a short note on structure of an Operon.
9. What is Feedback Regulation ? How are allosteric enzymes useful in the process of regulation of gene expression ?
10. Using suitable examples explain the role of cAMP in the process of gene regulation.

### **Section-C**

#### **Unit-I**

11. Explain the role of topoisomerase and DNA Polymerase in Prokaryotic DNA Replication.
12. Write short notes on B DNA and Z DNA.

#### **Unit-II**

13. Write a detailed note on the process of reverse transcription.
14. Explain the process of Prokaryotic Translation.

#### **Unit-III**

15. Explain Lac Operon in *E.coli*.
16. What is Stringent Response ? Explain the role of ppGpp(p) in regulation process.