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.

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 β-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 Operation.

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.