

Roll No. : .....

Total No. of Questions : 16 ]

[ Total No. of Printed Pages : 3

# SMIC-120

M.Sc. (Ist Semester) Examination, 2021

## MICROBIOLOGY

Paper - MB-103

(Molecular Biology)

Time : 1½ Hours ]

[ Maximum Marks : 40

### Section-A

(Marks : 1 × 10 = 10)

**Note :-** Answer all *ten* questions (Answer limit **50** words). Each question carries 1 mark.

### Section-B

(Marks : 3 × 5 = 15)

**Note :-** Answer any *five* questions by selecting at least *one* question from each Unit (Answer limit **200** words). Each question carries 3 marks.

### Section-C

(Marks : 5 × 3 = 15)

**Note :-** Answer any *three* questions by selecting *one* question from each Unit (Answer limit **500** words). Each question carries 5 marks.

### Section-A

1 each

1. (i) Name the *three* Stop Codons.
- (ii) What do you understand by Linking Number ?
- (iii) List any *two* conditions responsible for DNA Damage.

BI-1041

( 1 )

SMIC-120 P.T.O.

- (iv) Briefly explain COPY–PASTE mechanism of Transposition.
- (v) Throw light upon the role of SMC proteins in DNA packaging.
- (vi) What do you understand by ‘Cot Curve’ ?
- (vii) State the ‘Central Dogma’.
- (viii) Write a note on the Organisation of Chromatin.
- (ix) Compare Prokaryotes and Eukaryotes on the basis of Nuclear Organisation.
- (x) What is Antitermination ?

### **Section–B**

3 each

#### **Unit–I**

- 2. Write a note on Topological Properties of DNA.
- 3. Differentiate between Coding and Non-coding DNA.
- 4. What is the role of leading and lagging strands in DNA replication in *E.coli* ?

#### **Unit–II**

- 5. In which group of organisms was the process of reverse transcription discovered ?  
List essential steps of this process.
- 6. Discuss the structure of RNA Replicase ?
- 7. Write an account of ‘Ribozymes’.

#### **Unit–III**

- 8. Give one example each of induction and repression observed in the process of Gene Regulation.
- 9. Explain ‘Homeodomain’.
- 10. Write a note on TATA-binding Proteins.

**Section-C**

5 each

**Unit-I**

11. Discuss the three-dimensional structure of DNA (Draw diagram where necessary).
12. Write notes on the following :
  - (i) Repetitive DNA Sequences
  - (ii) DNA Denaturation

**Unit-II**

13. Explain in detail the post-translational modifications in Eukaryotes.
14. Discuss the process of Transcription in Prokaryotes.

**Unit-III**

15. Describe Lac Operon with special reference to catabolite repression.
16. Write notes on the following :
  - (i) Attenuation
  - (ii) Gp Islands