

Roll No.

Total Pages : 03

LMDE/M-24

7033

MOLECULAR BIOLOGY-I

(w.e.f. 2023-24)

BCH-204

Time : Three Hours]

[Maximum Marks : 80

Note : Question No. **1** is compulsory. Attempt *four* more questions, selecting *one* question from each Section. Each question carries 16 marks.

1. (i) Discuss some characteristic features of Z form of DNA.
- (ii) What is C value paradox ?
- (iii) What is leading and lagging strand ?
- (iv) Define Okazaki fragments. Why are they formed ?
- (v) Discuss some structural feature of group I intron and their splicing reaction.
- (vi) What are overlapping genes ? Discuss with the help of suitable example.
- (vii) What are post-translational modifications ? Why they occur ?
- (viii) What is signal hypothesis ? **16**

Section I

2. (a) DNA acts as genetic material. Prove this statement through various experimental evidences.
- (b) Discuss various forces responsible for stability of DNA. **8×2=16**
3. (a) Discuss different levels of DNA organization in eukaryotes.
- (b) What is DNA denaturation ? Discuss various methods to carry out DNA denaturation. **8×2=16**

Section II

4. (a) Define DNA replication. What are the possible modes of DNA replication ? Discuss Meselson-Stahl experiment to discuss the actual mode of DNA replication.
- (b) Discuss the structure of DNA polymerase III. What are the functions of this enzyme ? **8×2=16**
5. (a) Discuss the mechanism of prokaryotic replication process. Also draw the diagrams wherever possible.
- (b) Discuss about point mutations, missense mutations and nonsense mutations.
- (c) Discuss Ames test of mutagenicity. **16**

Section III

6. Write notes on the following : **16**
- (a) Structure of RNA polymerase of prokaryotes.
- (b) Principle, Technique and significance of DNA footprinting technique.
- (c) Structure and functions of reverse transcriptase enzyme.
7. (a) What are post transcriptional modifications ? Discuss the processing events for heterogenous nuclear RNA.
- (b) Discuss the splicing mechanism for Group IV introns. **8×2=16**

Section IV

8. (a) Discuss various characteristics of genetic code.
- (b) Describe various features of Wobble hypothesis.
- (c) Discuss the structure and functions of prokaryotic ribosomes. **16**
9. Describe various steps for translation process in prokaryotes. **8×2=16**