

1065

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5. (a) Name any five types of proteins/enzymes involved in DNA replication fork in prokaryotes. (5)
- (b) Draw the structure of tRNA. Name any two unusual bases present in tRNA. (3+2=5)
- (c) How the fidelity is maintained at various levels during replication? (5)
- (d) Define processivity of DNA polymerase enzyme. Explain its significance. (3)
6. (a) Write short note on (**any four**) : (4×4=16)
- (i) Nucleosomes
 - (ii) RNA polymerases in Eukaryotes
 - (iii) D loop replication
 - (iv) Mechanism of origin activation in prokaryotes
 - (v) Termination of transcription in prokaryotes
- (b) What are telomeric repeats? Mention their role. (2)

(200)

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 1065

I

Unique Paper Code : 2532013501

Name of the Paper : Principles of Molecular Biology – I

Name of the Course : B.Sc. (H) Microbiology

Semester : V UGCF, Part III

Duration : 3 Hours

Maximum Marks : 90

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any **five** questions.
3. **All** questions carry equal marks.

1. (a) Define the following (**any nine**) : (2×9=18)

- (i) Polycistronic transcription
- (ii) Catenation
- (iii) Ribozyme

P.T.O.

- (iv) Okazaki fragments
- (v) Split genes
- (vi) Replicators
- (vii) Linker DNA
- (viii) Replicon
- (ix) Ori C
- (x) Transcription bubble
- (xi) Pribnow box

2. (a) Differentiate between the following (**any four**) :

(4×4=16)

- (i) Topoisomerase type I and type II
- (ii) DNA polymerase I and DNA polymerase III
- (iii) Prokaryotic promoter and Eukaryotic promoter
- (iv) GTFs and Transcription factors
- (v) Z and A type of DNA

(b) Give any one role/significance of the following :

(1×2=2)

- (i) DNA ligase
- (ii) Rho

3. (a) Explain Meselson and Stahl's experiment demonstrating semiconservative nature of DNA replication. (6)
- (b) What is linking number? Explain with suitable examples diagrammatically. Calculate the linking number of a covalently closed circular DNA of 16000 base pairs having 08 negative supercoils. (4+3=7)
- (c) What is denaturation of DNA? Explain various factors which influence the denaturation and how it changes the properties of DNA. (5)
4. (a) Give a detailed account of structure of DNA organization in prokaryotes. (3.5)
- (b) Expand and give significance of the following (**any five**) : (2×5=10)

ARS, ORC, TBP, TFIID, TERT, C₀t value
- (c) Describe the contribution of the following scientists : (1.5×3=4.5)
 - (i) Elizabeth H. Blackburn
 - (ii) Arthur Kornberg
 - (iii) Rosalind Franklin